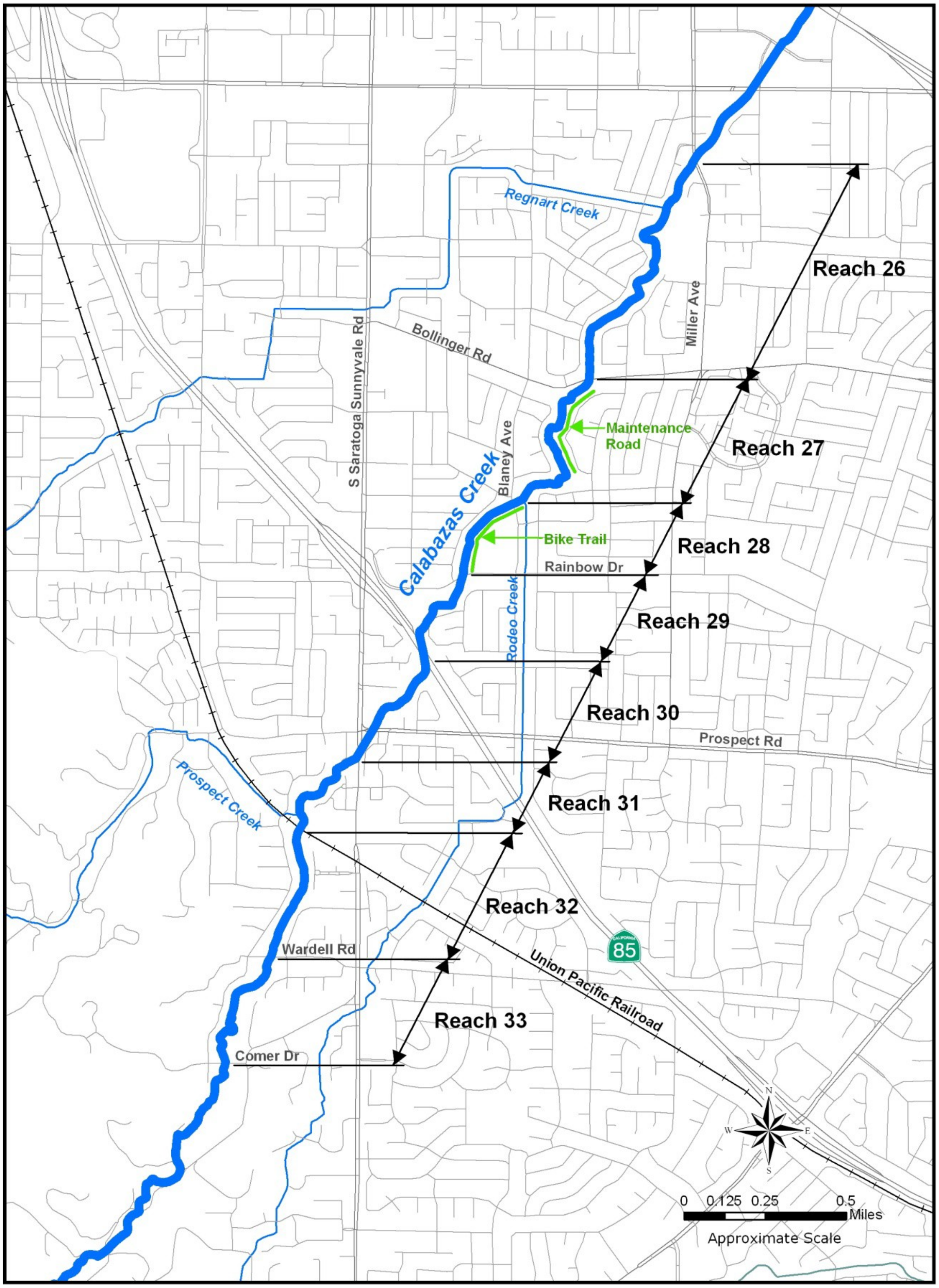
APPENDIX A

CALABAZAS CREEK

PROJECT REACH MAP



Calabazas Creek Reaches

Miller Avenue to Comer Drive

REACH 26

Reach 26: Upstream of Miller Avenue to upstream Bollinger Road Bridge (Sta 403+39.5 to Sta 447+07)

Reach Description:
In this reach, the channel is a trapezoidal natural earth channel. The alignment varies from straight to sinuous sections. The channel invert in some areas consists of significant sediment deposition covered with some undergrowth vegetation. However, most invert material is sandy with gravel and some pieces of rock. All sack concrete sections are trapezoidal in shape. In some areas both banks are heavily vegetated with mature trees and other vegetation. In other areas they are heavily eroded and covered with tree roots, cracks and scour on bare soil.

Bollinger Bridge is a culvert. Hydraulic analyses modeled the bridge as an open channel since pressure flow does not appear to be a factor even during the 1% event.

This entire reach is located in the City of Cupertino. The east and west sides of the creek in this reach are both lined with residential single family homes. Distinctive features in this reach include one pedestrian bridge which is located upstream of Regnart Creek one of the major tributaries. Regnart Creek is 1000 feet upstream of Miller Avenue and it conveys 560 cfs of flow into Calabazas Creek during the 1% storm.

Right-of-Way: The District possesses enough right-of-way at this location. Refer to Figure 1 for details.

Reach Average Invert Slope: Invert approximate average slope for this reach is 0.0054 (from STA 403+39.5 to STA 446+35)

1% Flow:
2650 cfs – Miller Avenue (STA 403+39.5) to d/s Regnart Creek (STA 408+36.8)
2100 cfs – u/s Regnart Creek (STA 409+31.8) to Bollinger Rd Ramp (STA 444+31.9)
2000 cfs – Bollinger Rd Ramp (STA 445+29.5) to u/s Bollinger Rd (STA 447+07)

10% Flow:
1650 cfs – Miller Avenue (STA 403+39.5) to d/s Regnart Creek (STA 408+36.8)
1300 cfs – u/s Regnart Creek (STA 409+31.8) to Bollinger Road Ramp (STA 444+31.9)
1200 cfs - Bollinger Rd Ramp (STA 445+29.5) to u/s Bollinger Rd (STA 447+07)

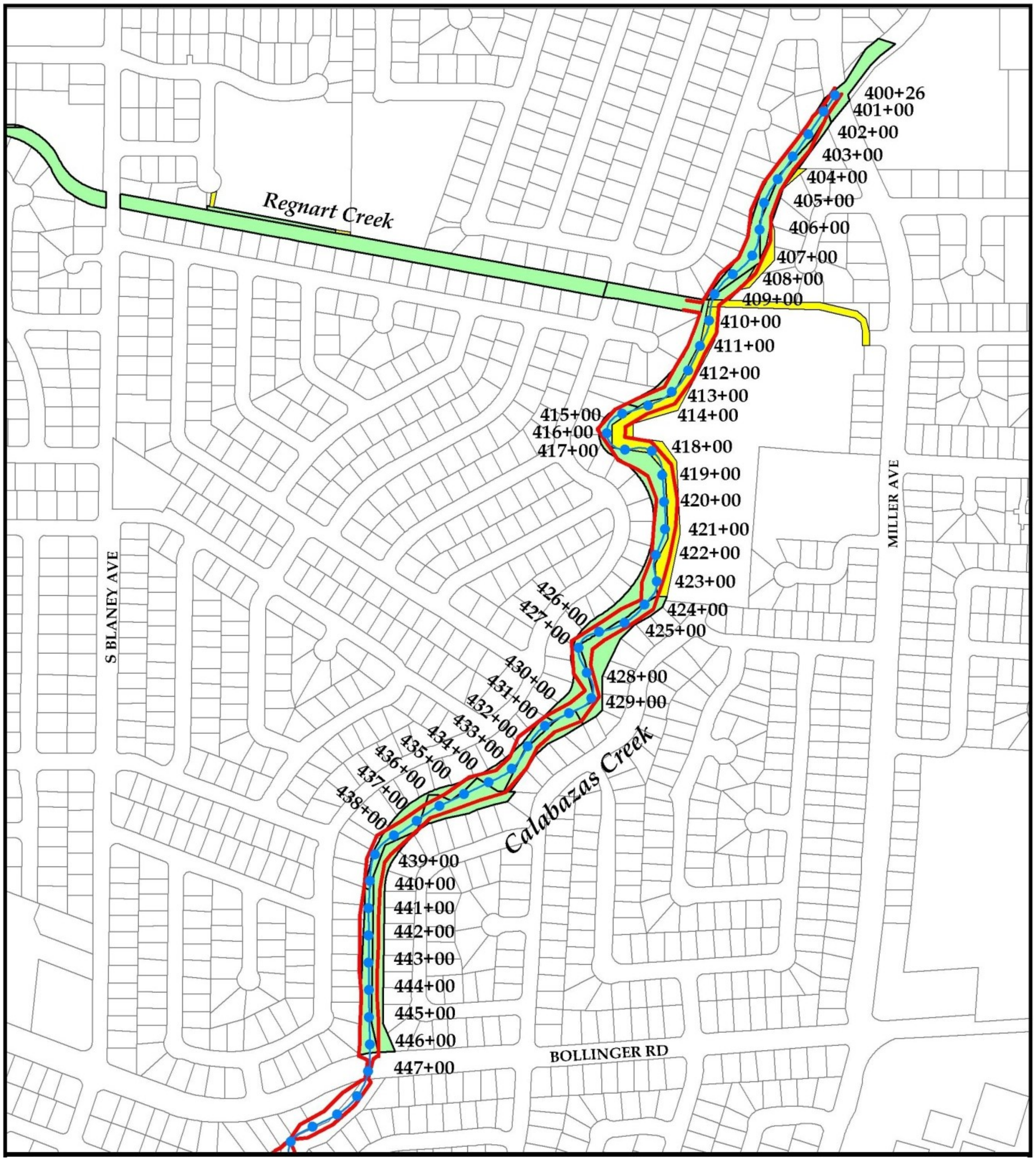
Current Reach Capacity: This reach has the capacity to convey 1% flow (2650 cfs to 2000 cfs) from upstream of Miller Avenue to upstream of Bollinger Road Bridge.

Reach Flooding area Profiles: No flooding issues exist within this reach.

Reach Roughness Coefficient: The reach roughness coefficient (Manning's "n" value) is calculated, see Calabazas Creek Manning's "n" value Report.

Reach Typical Photos: See the following pages for typical photos and their channel descriptions. Pagination of photos is 26-1 to 26-14. For location and stationing see Figure 1.

Reach Erosion Problem: Several severe erosion sites and a scour area were found in this reach.
See the following photos for the location and more details.



Calabazas Creek
Reach 26
Miller Ave. to Bollinger Rd.

Figure 1

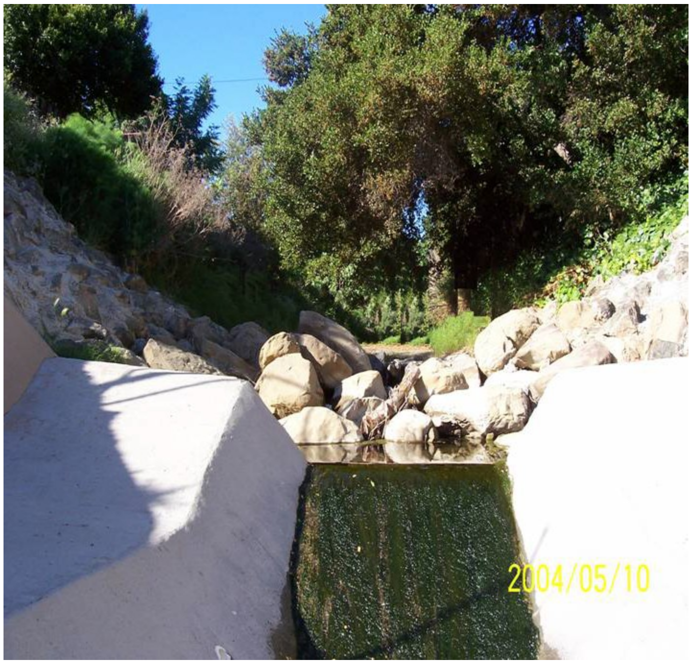
Top of Bank

Contol Line

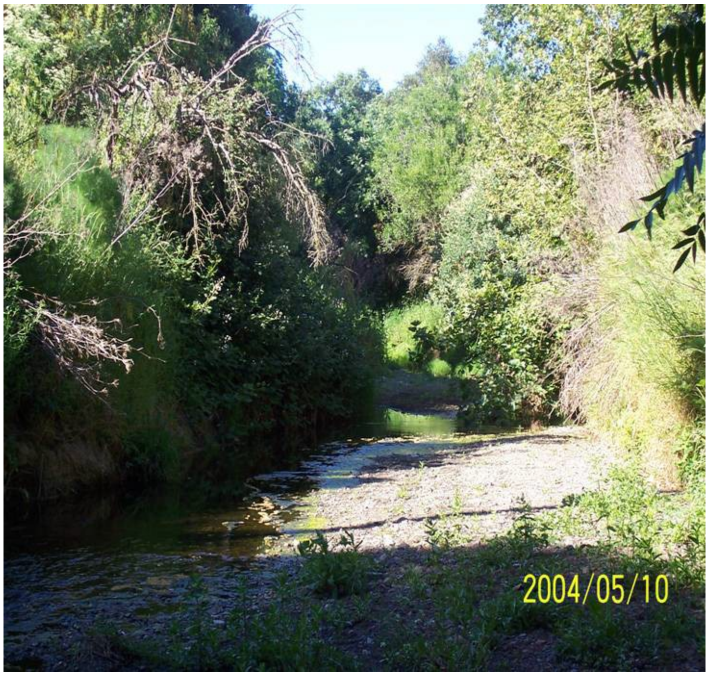
SCVWD Fee

SCVWD Easement

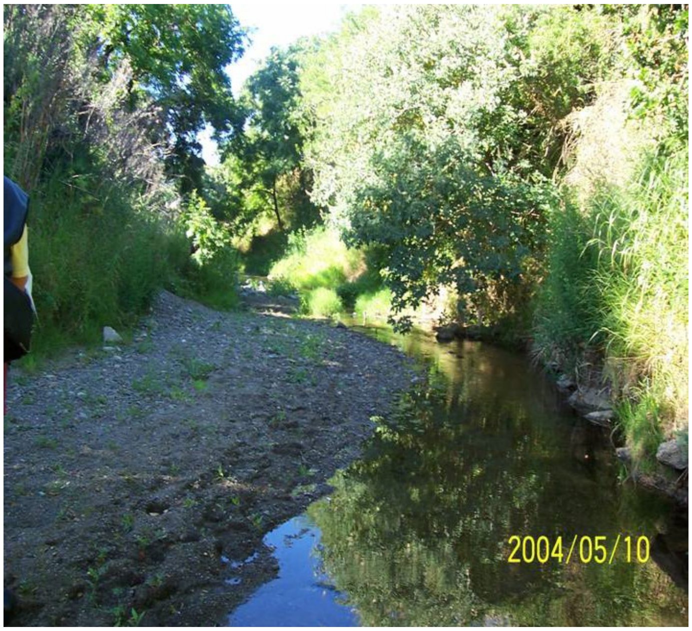
CALABAZAS CREEK



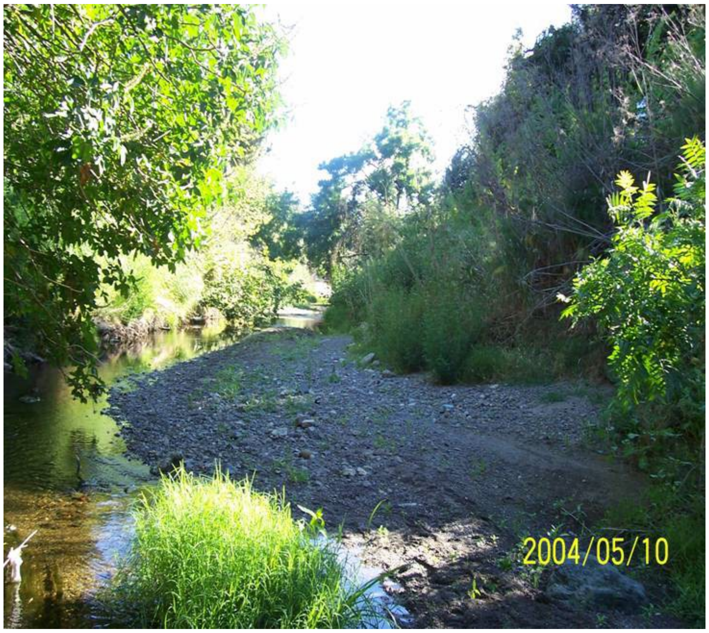
king Upstream, sloped drop structure located at upstream of
er Avenue (STA 401+26)



Looking Upstream (STA 402+86)



king upstream, (STA 403+01)

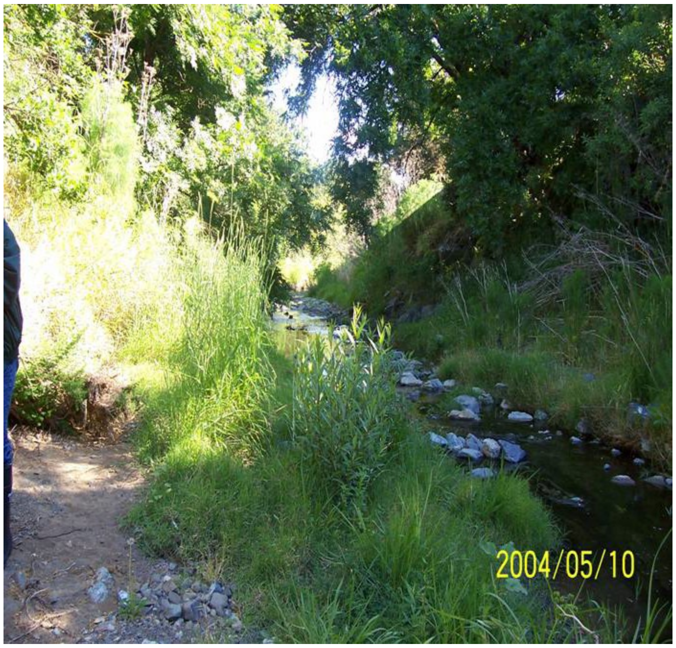


Looking Downstream, (STA 403+01)

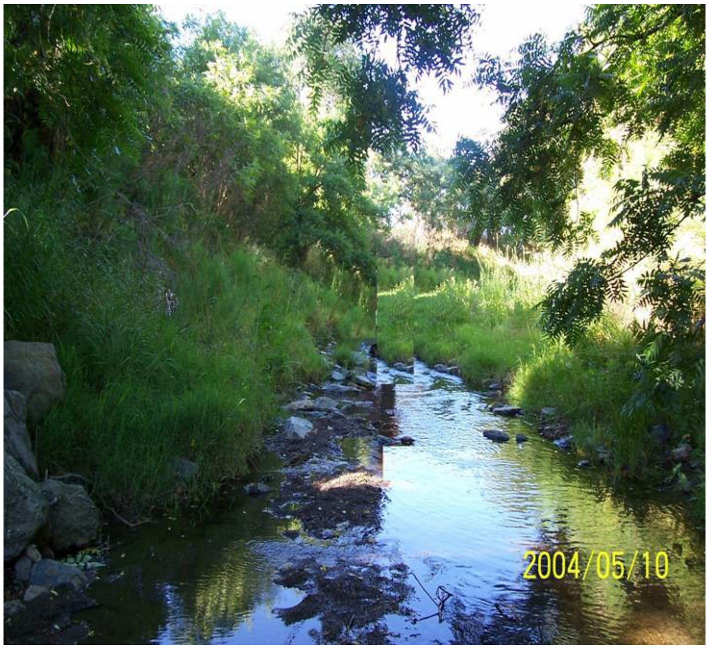
Channel Description:

The channel is earth trapezoidal with straight to some meandering alignment. Channel invert is covered with some vegetation and a significant sediment deposition. The channel is heavily vegetated on both sides with mature trees and some other vegetation.

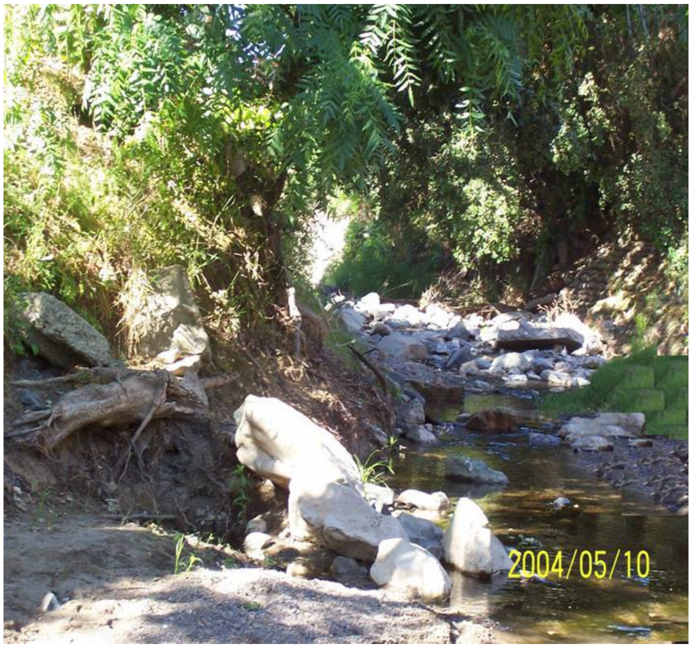
CALABAZAS CREEK



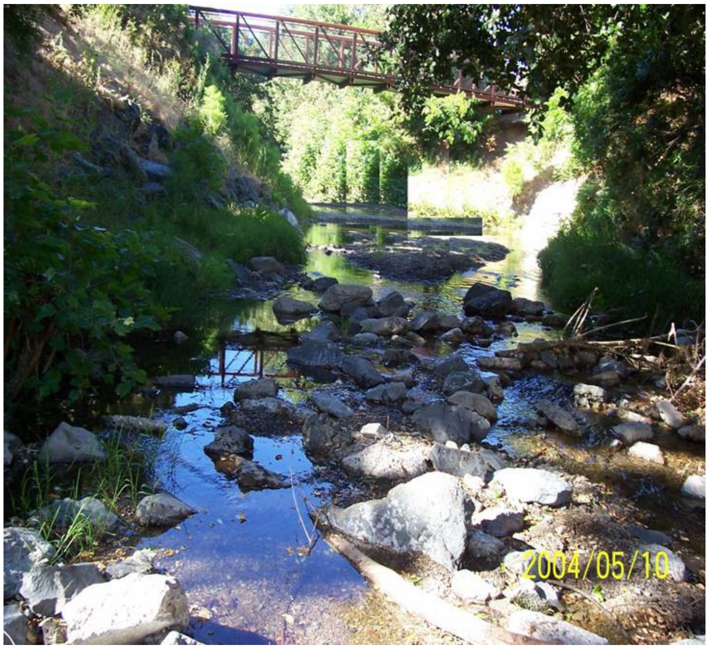
'A 404+75)



(STA 404+75)



'A 408+21)

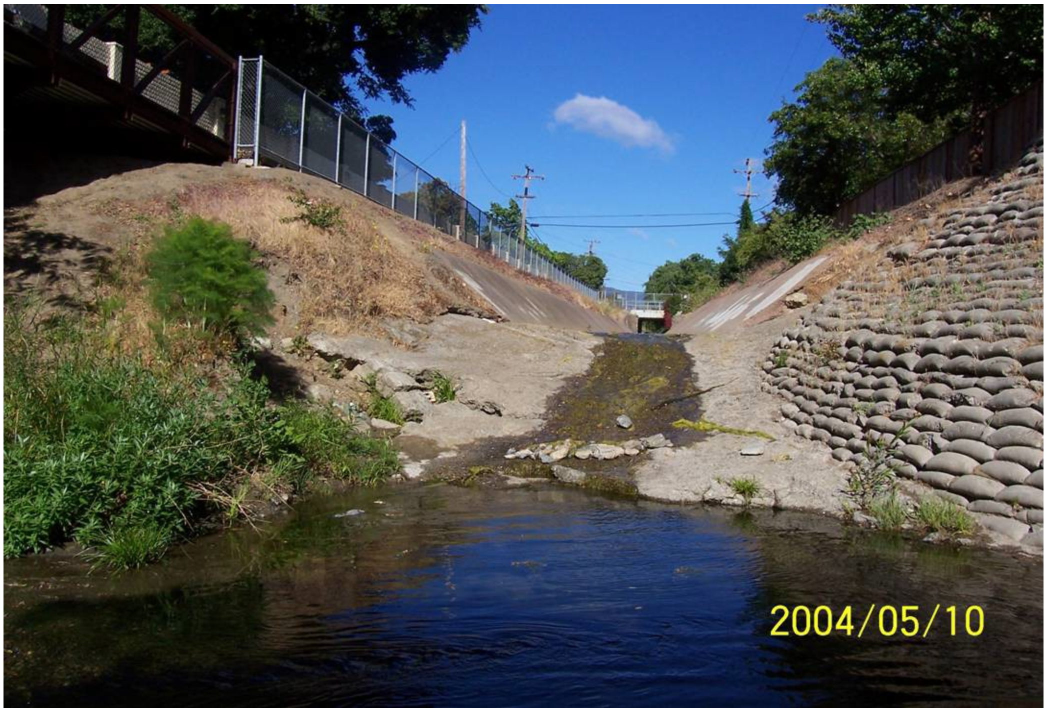


(STA 408+72)

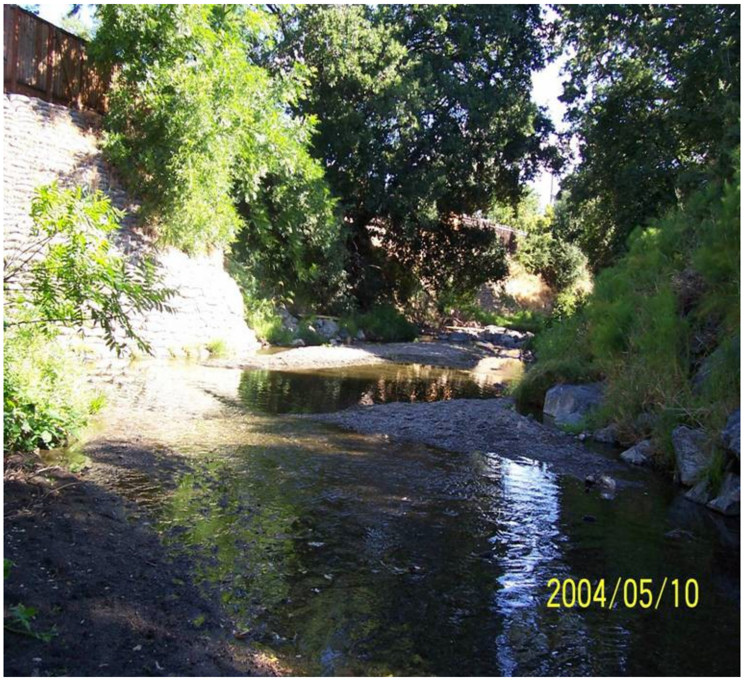
Looking Upstream, downstream of pedestrian bridge

Channel Description:

The earth trapezoidal shaped channel varies from straight to sinuous alignment with some steep slopes covered with a few mature trees, some grass and natural soil. Bottom invert is relatively wide in some areas and covered with rocks and gravel.



Looking Upstream, on the right bank Regnart creek joins Calabazas creek about 1000 feet upstream of Miller Avenue. Regnart creek carries about 500 cfs of flow into the Calabazas creek. (STA 409+54)

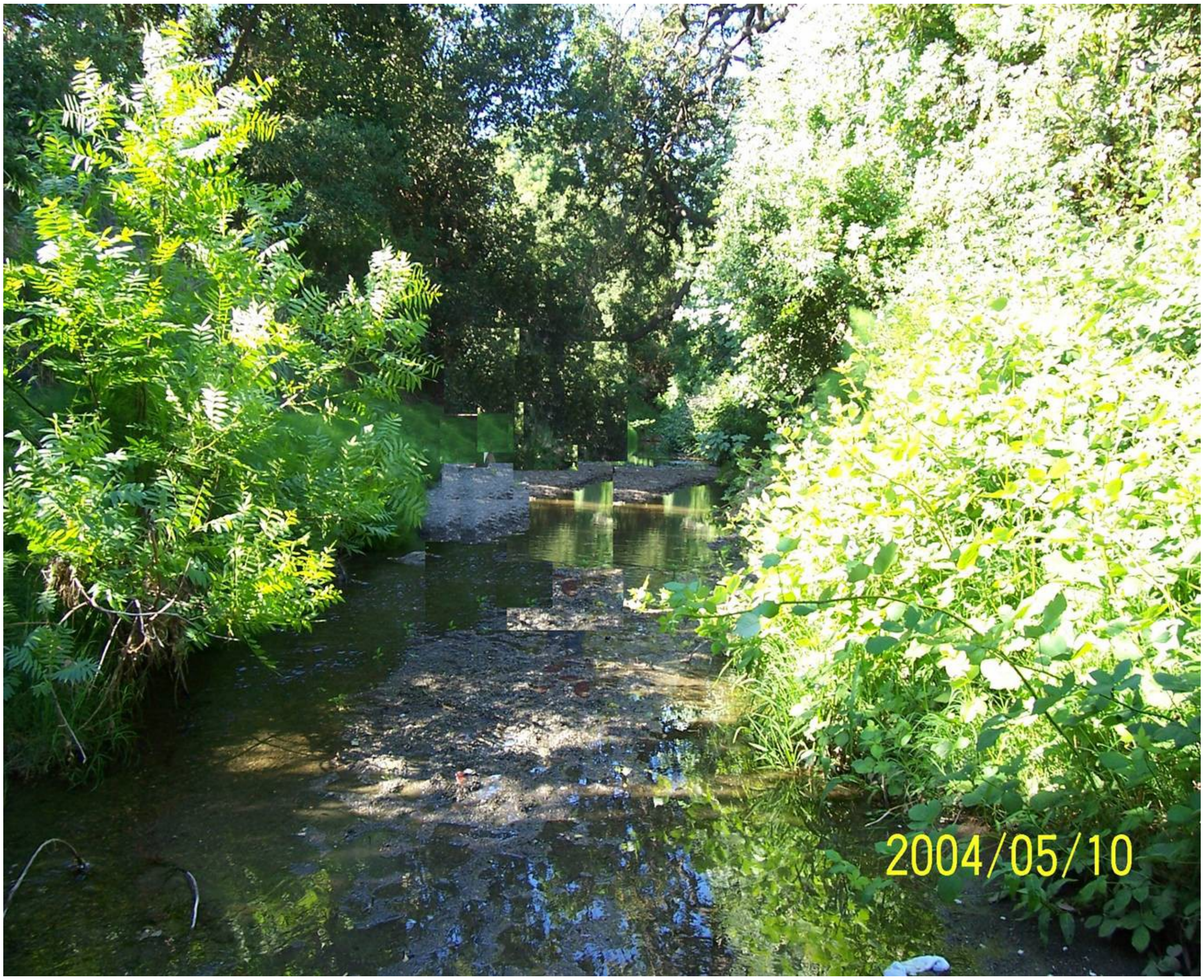


Looking Downstream at outfall downstream of Regnart Creek and a pedestrian bridge. (STA 409+93)

Channel Description:

Channel is earth trapezoidal with straight to some meandering alignment. Left bank is covered with sack concrete with a few mature trees. Right bank is natural soil covered with some trees and other vegetation. Invert is covered with some rocks and gravel.

CALABAZAS CREEK

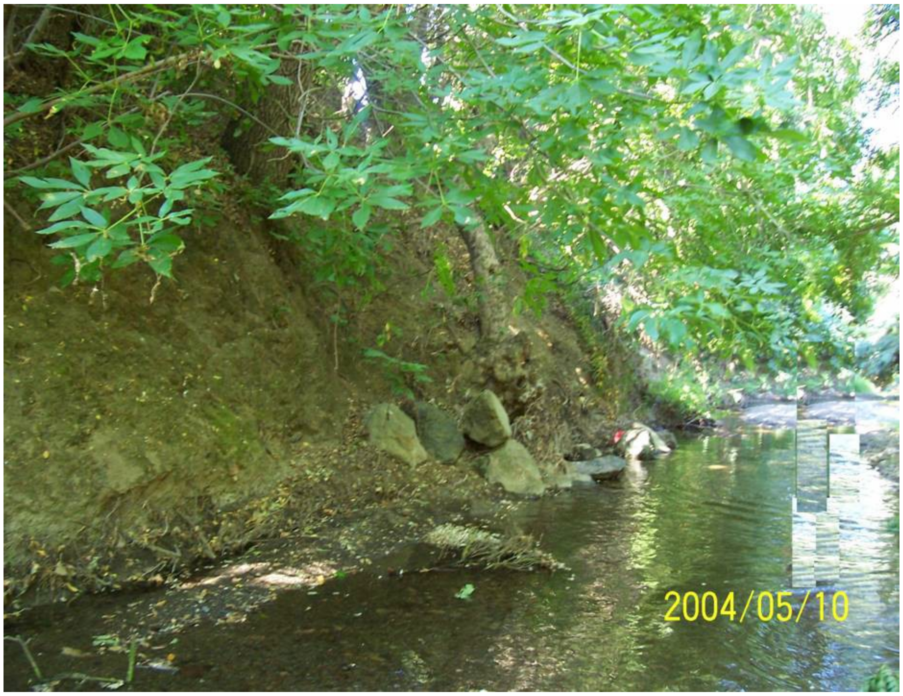


Looking Upstream – just past pedestrian bridge (STA 410+42)

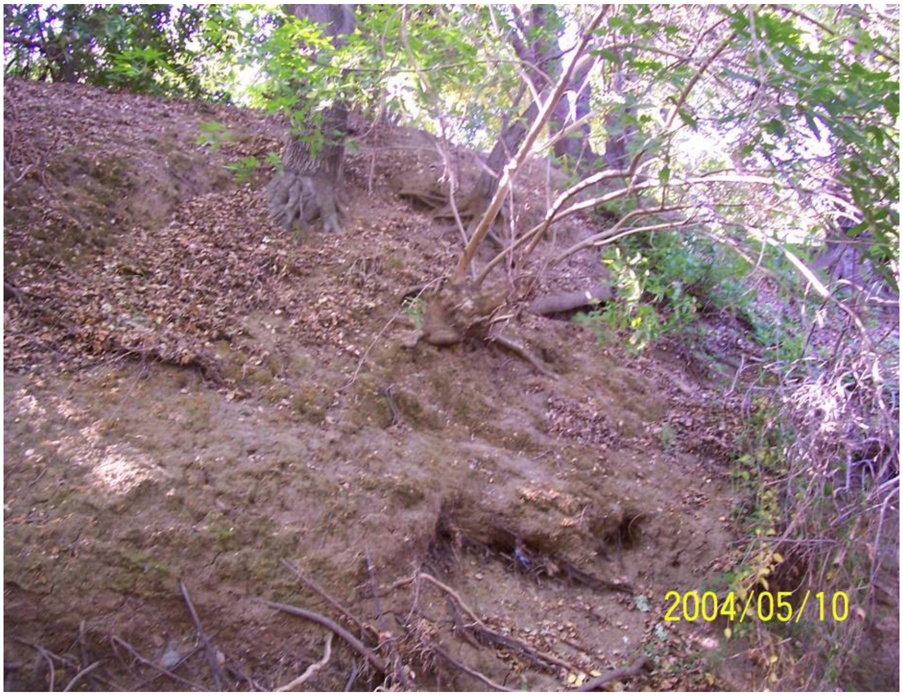
Channel Description:

The channel is heavily vegetated with mature trees with a straight to meandering alignment and a trapezoidal shape. Very wide bottom width consists of sands and gravel.

CALABAZAS CREEK



Looking Upstream (STA 410+82) ±

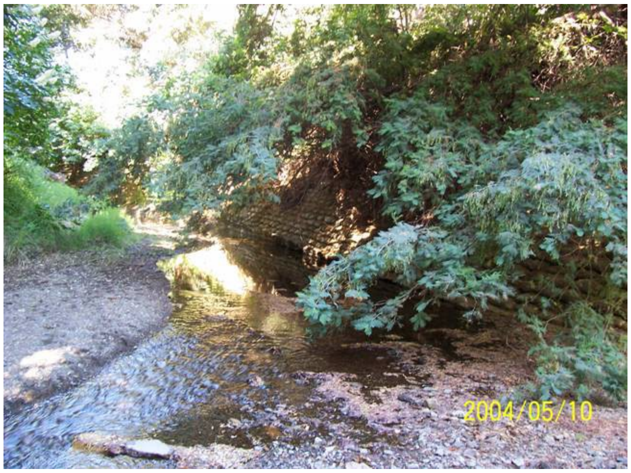


Looking Upstream left bank (STA 412+11) ±

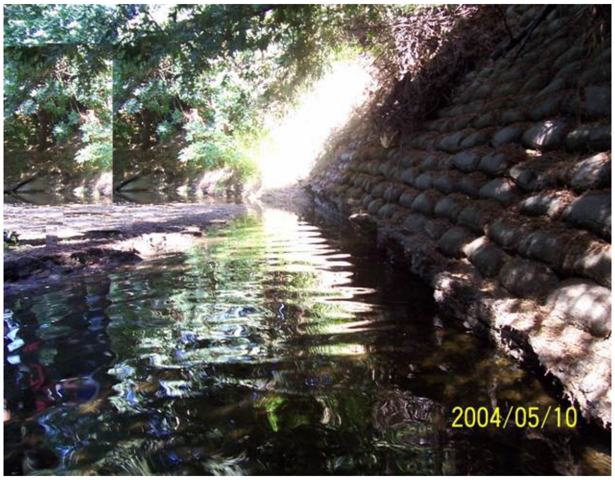
Channel Description:

Earth channel with trapezoidal shape and firm soil material. Erosion on the west bank with very few trees. Very wide bottom width covered with sand and gravel and some rocks on the edge of left invert.

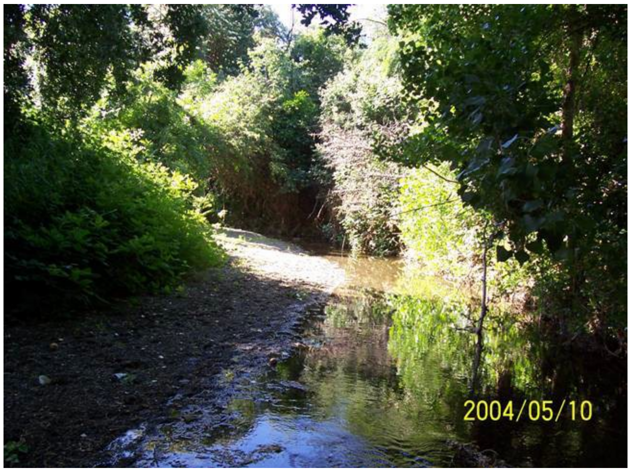
CALABAZAS CREEK



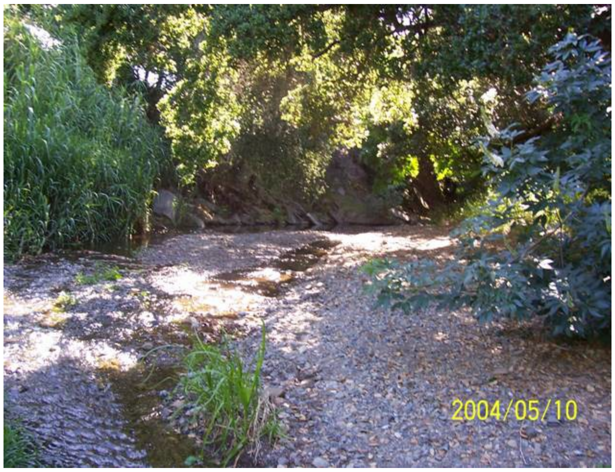
Looking Upstream, downstream of sharp bend, right bank sack concrete (STA 413+43)



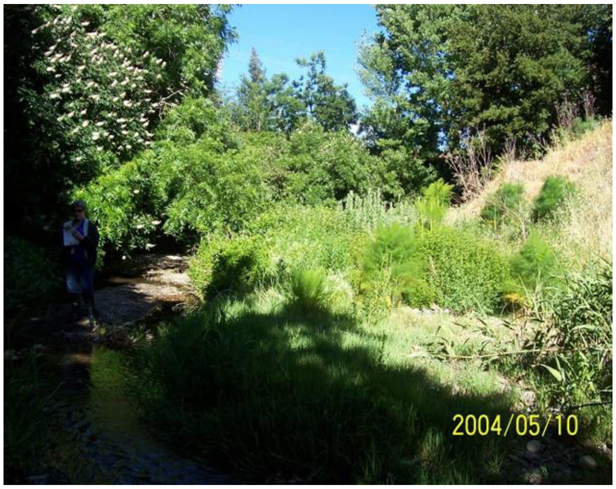
Looking Upstream, downstream of sharp bend, right bank sack concrete (STA 414+17) ±



Looking Upstream at sharp bend (STA 416+50) ±



Upstream of sharp bend (STA 417+42)



Looking Downstream at sharp bend (STA 421+52)

Channel Description:

The channel is sinuous, looking upstream right bank is covered with sack concrete. Both banks are fully vegetated with large to small trees. The channel invert consists of sediment deposition partially covered with heavy grass.

CALABAZAS CREEK

(STA 421+70)

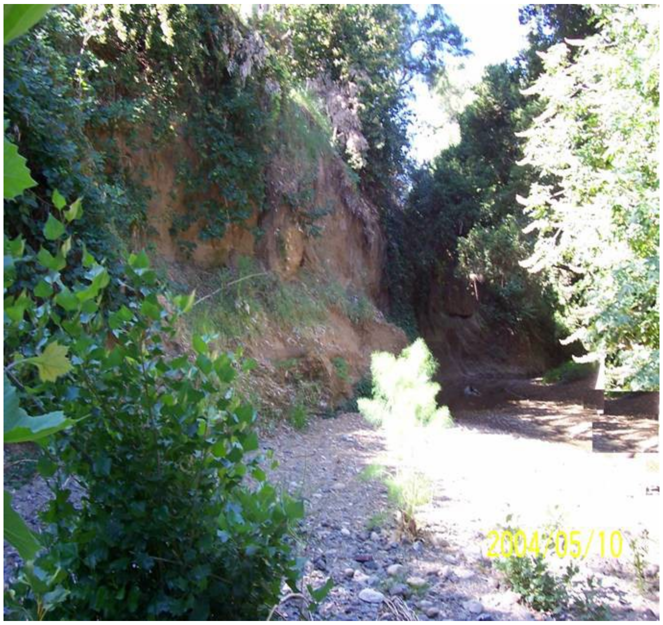
(STA 421+90)

Looking Upstream into shady bend with rock on the bank slope area
(STA 422+04) ±

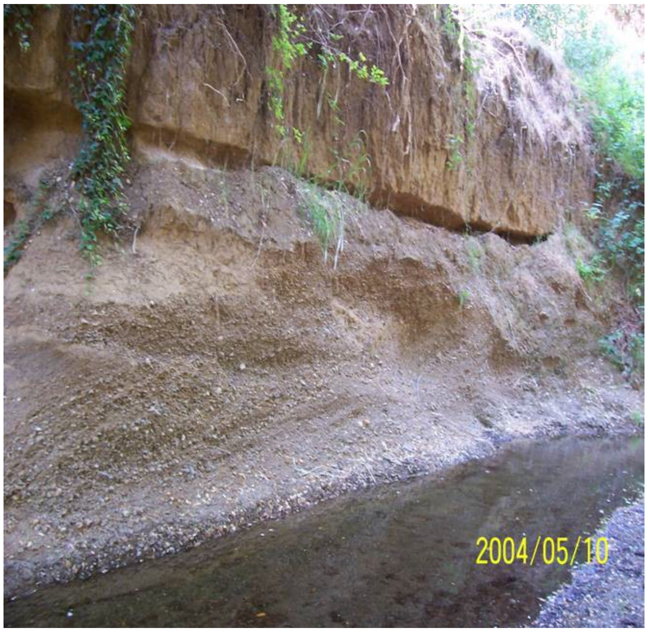
Channel Description:

The channel is a curved trapezoidal earth channel. Bank slopes consists of rocks covered with limited undergrowth of grass and very few small trees. The channel material is sand and gravel.

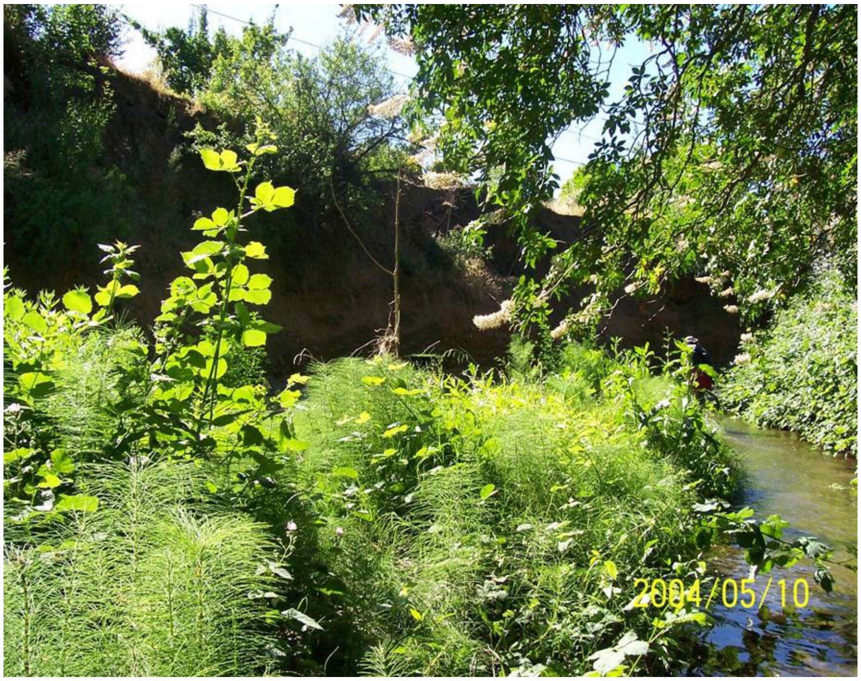
CALABAZAS CREEK



(STA 424+30)



(STA 426+10)



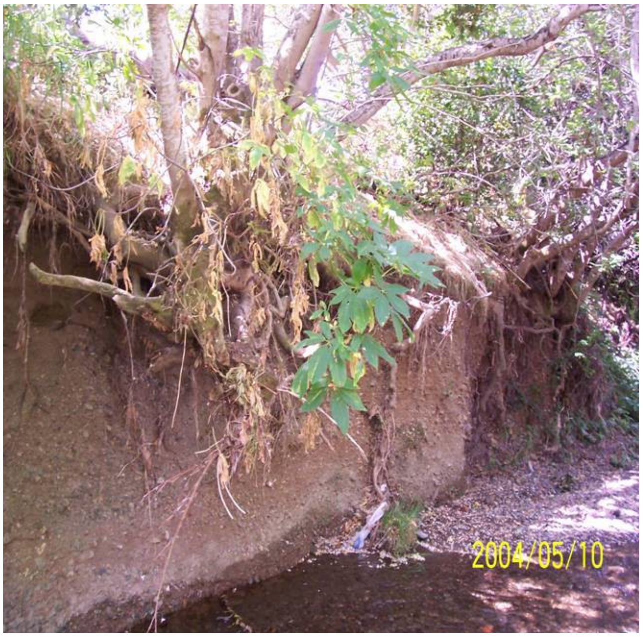
(STA 427+00)

Looking Upstream

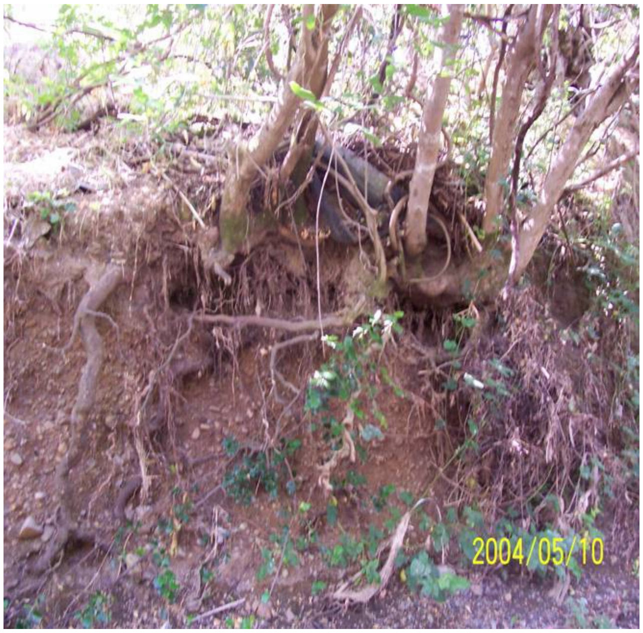
Channel Description:

The natural channel transitions from straight in some parts to meandering in others. Top width and invert is very wide in some locations and covered with some undergrowth grass. Left bank heavily eroded and some cracks and scour on the left bank slope. The channel material is sandy with some cobbles.

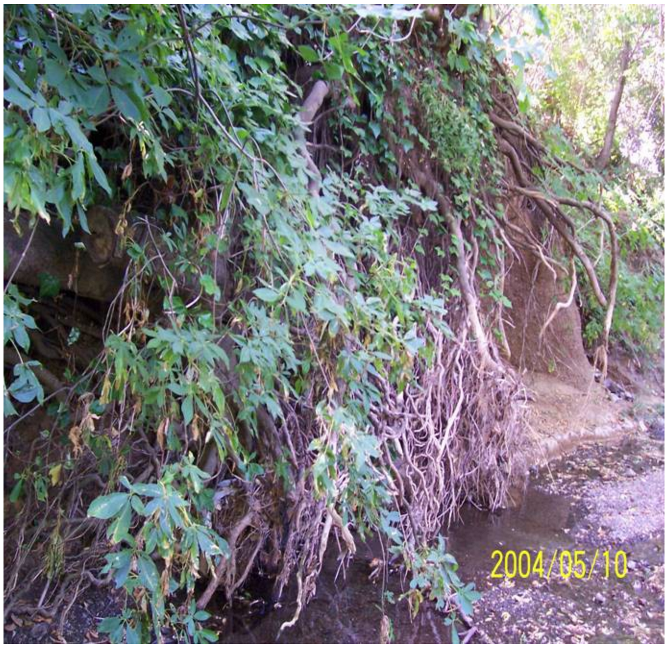
CALABAZAS CREEK



(STA 428+68) ±



(STA 428+88) ±



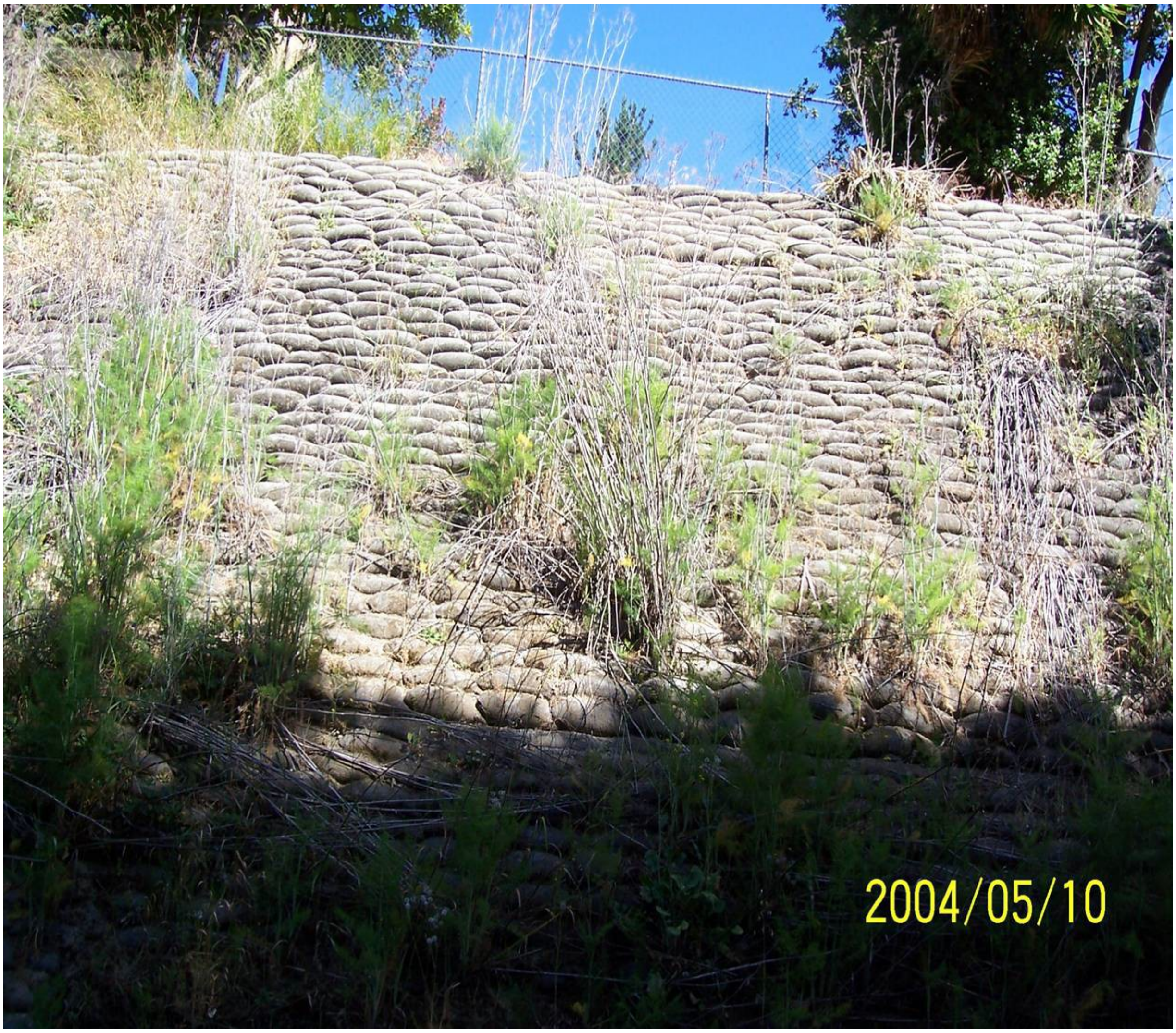
(STA 430+03) ±

Looking Upstream

Channel Description:

The channel is a trapezoidal natural channel. Heavy erosion on the left bank which consists of tree roots hanging over the channel from top of the bank on bare and firm soil.

CALABAZAS CREEK

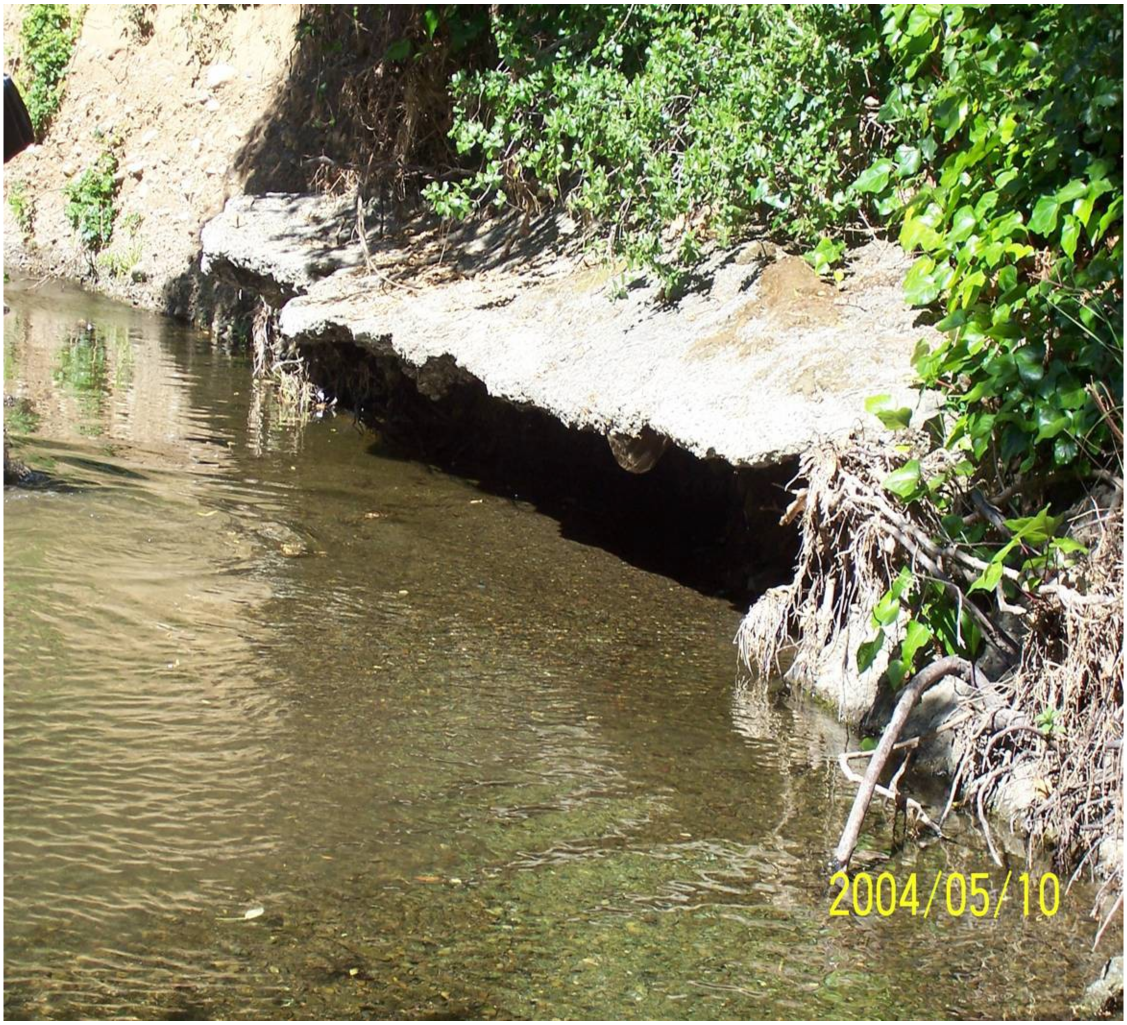


(STA 430+83)

Channel Description:

The channel is a trapezoidal earth channel. Looking upstream left bank slope consists of sack concrete covered with a very few trees on top of the left bank.

CALABAZAS CREEK

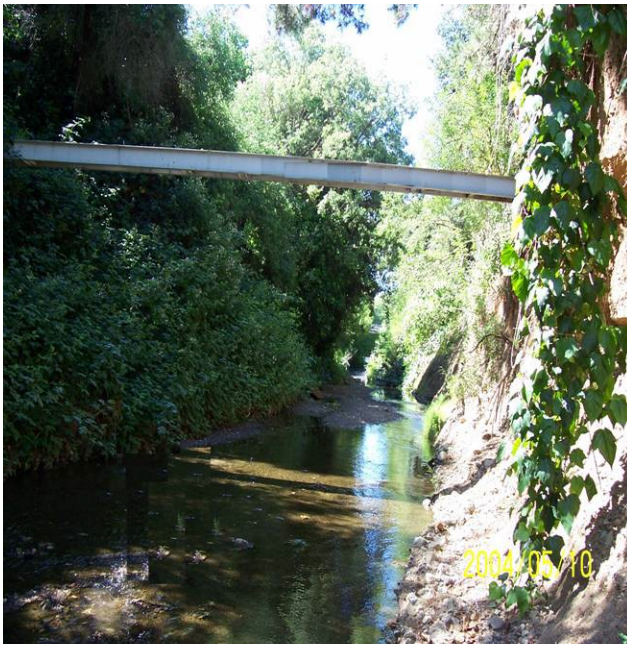

2004/05/10

(STA 436+11)

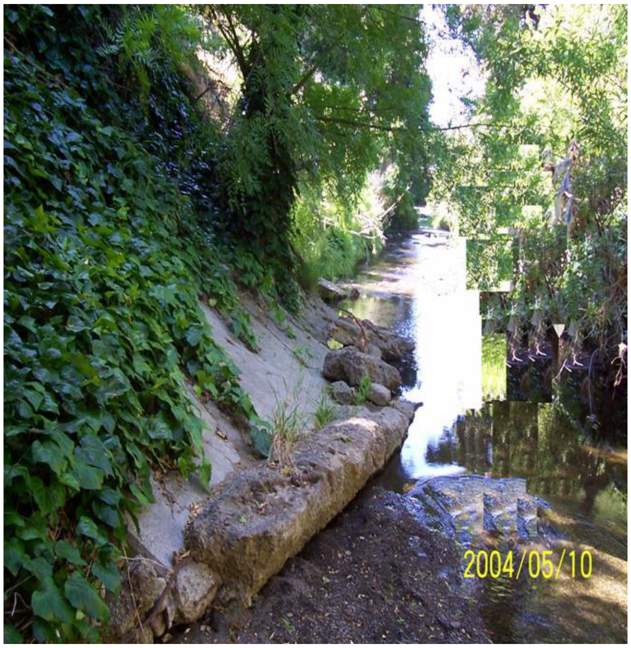
Channel Description:

Trapezoidal natural channel. Looking upstream, scour under shotcrete east bank slope. East bank slope is covered by some undergrowth ivy. Channel material consists of sand and gravel.

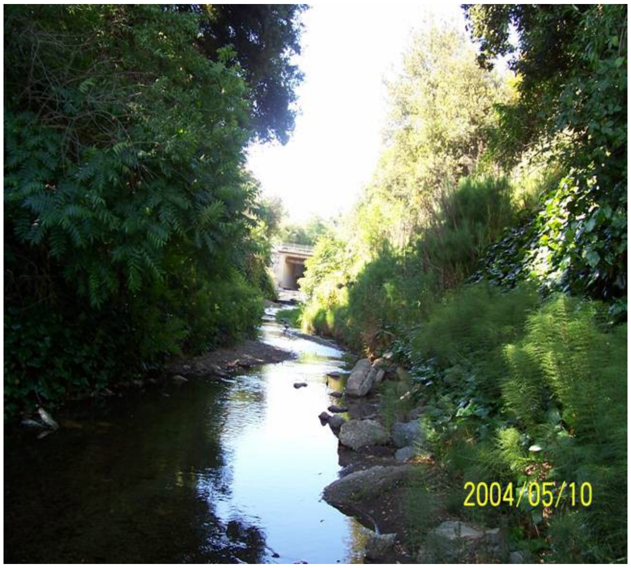
CALABAZAS CREEK


2004/05/10

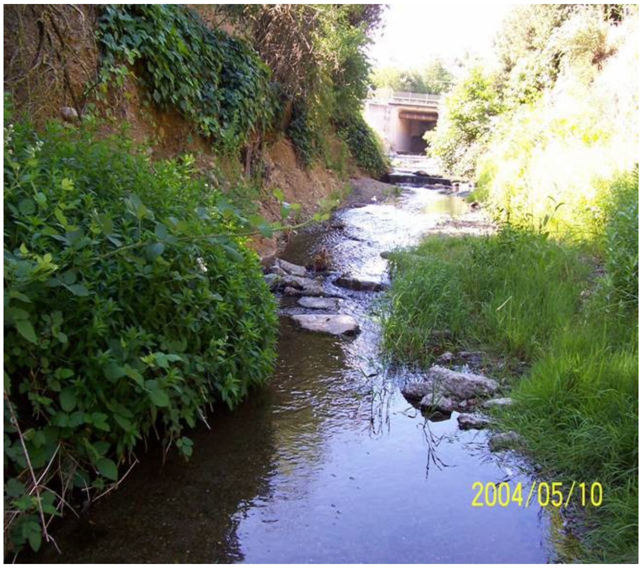
Utility crossing (STA 437+20)


2004/05/10

(STA 437+80)


2004/05/10

(STA 438+40) ±


2004/05/10

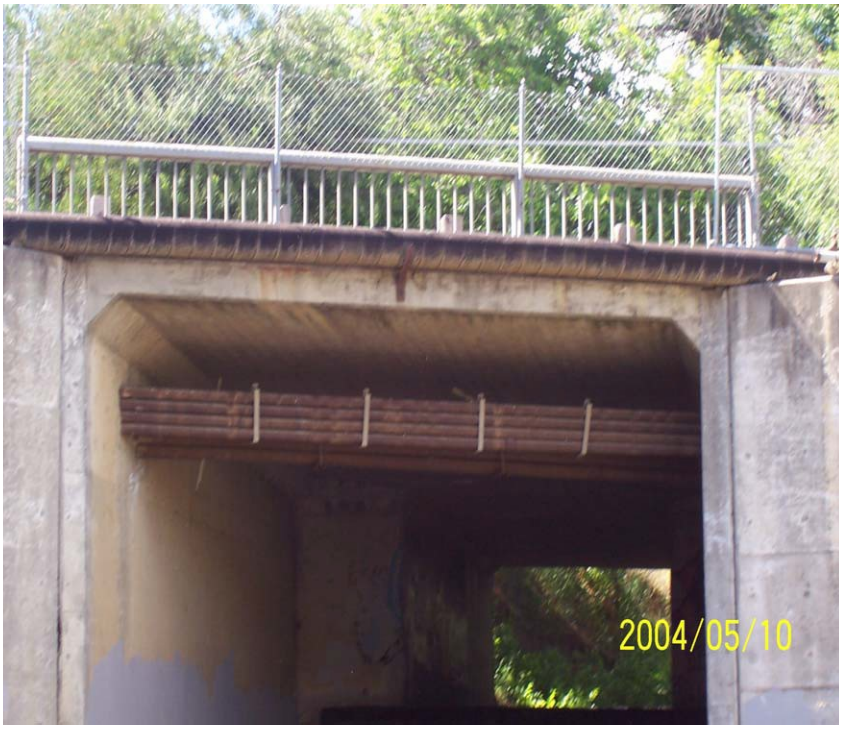
(STA 440+50) ±

Looking Upstream, downstream of Bollinger Bridge

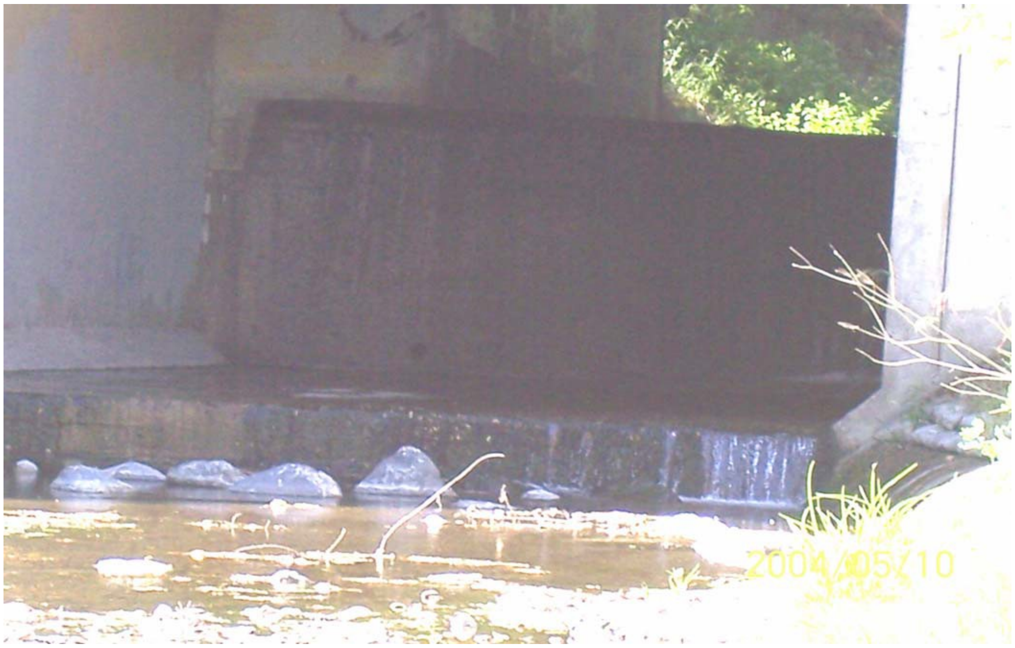
Channel Description:

The channel is a trapezoidal natural straight with some meandering alignment. In some area left bank is concrete and covered with ivy and in other area eroded bare soil. The Channel in most areas is well vegetated with mature trees and limited undergrowth vegetation.

CALABAZAS CREEK

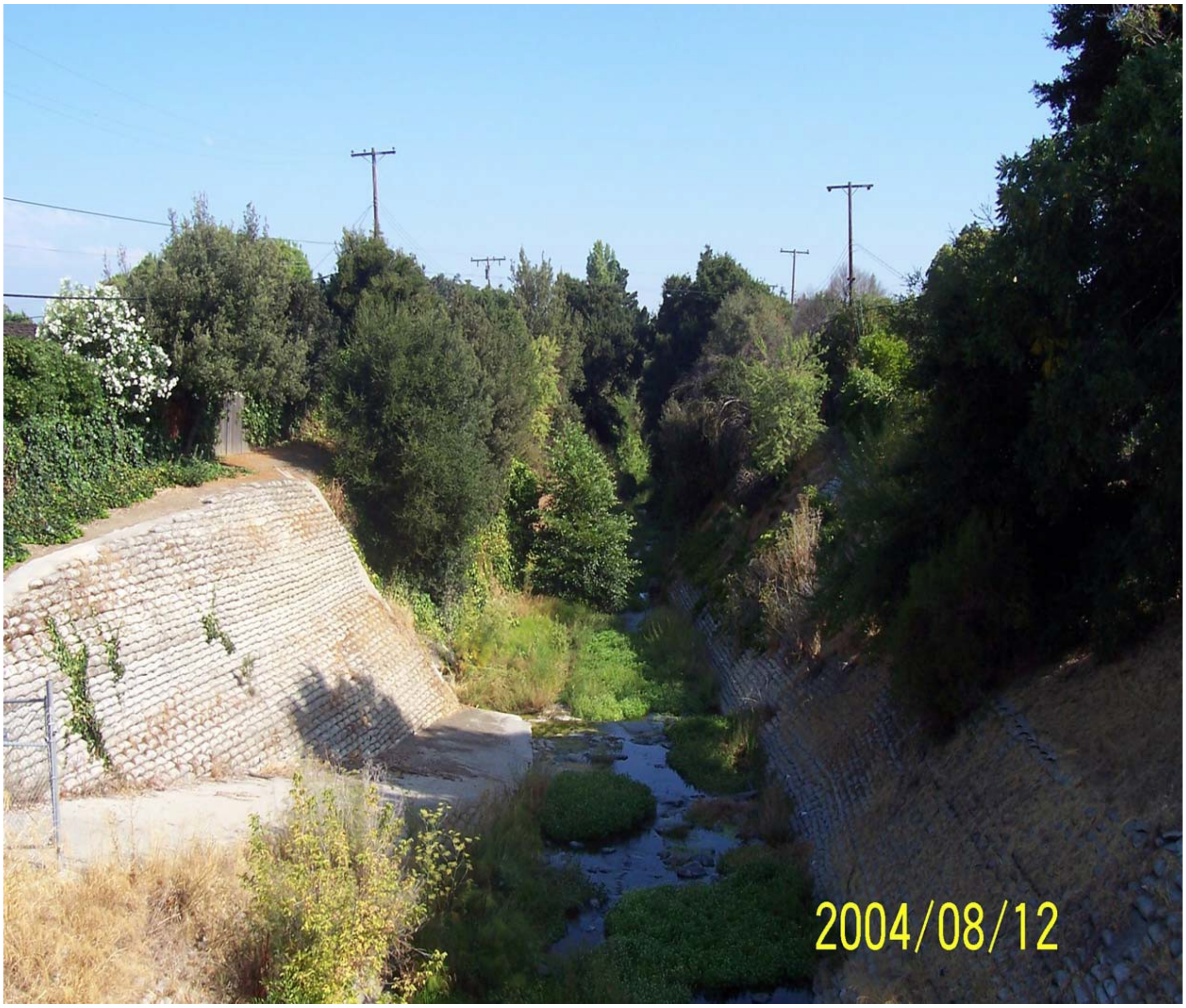


Looking Upstream, downstream of Bollinger Bridge as of October 2004 (STA 446+00)



Looking Upstream, inside the Bollinger Bridge with 11 feet of drop structure as of October 2004 (STA 446+50)

CALABAZAS CREEK



Looking Downstream from downstream of Bollinger Bridge (STA 446+57)

Channel Description:

The channel is a very wide straight natural channel. Both bank slopes consists of sack concrete. Maintenance ramp on the west side of downstream face of Bollinger Road and very narrow maintenance road on top of both banks. Channel bottom consists of sand and gravel covered with watercress. The channel is heavily vegetated on both top of banks.

REACH 27

Reach 27: Upstream of Bollinger Road Bridge to upstream of Blaney Avenue Culvert (Sta 447+07 to Sta 478+28.9).

Reach Description:
In this reach, the channel is unimproved natural earth with a few sacked concrete erosion repair sites. The channel is trapezoidal in cross section and predominantly straight in alignment with some meandering. All sack concrete sections are trapezoidal. Both bank slopes are mostly vegetated with mature trees, ivy and other vegetation. Only a few areas are covered with bare soil. Bed material consists of mostly firm soil and some big rocks. Channel bottom sediment consists of sand and gravel. Concrete pieces are present within this reach.

Blaney Avenue Culvert is a 63 feet long double box culvert with each box about 11 feet in width.

The entire reach is located in the City of San Jose. Meyerholz Elementary School is located on the southwest bank of this reach. Distinctive features in this reach include the Rodeo Creek, a major tributary, which conveys 320 cfs of flow into Calabazas Creek 2700 feet upstream of Bollinger Road during the 1% storm.

Reach Right-of-Way: The District does not possess right-of-way at the locations shown below. Refer to Figure 2 for details.

Table 2: Insufficient right of way location within reach 27

Reach	Beginning Station	Ending Station	Length	Properties where District has insufficient ROW
27	447+45	450+80	335	2 residential
	452+09	453+20	111	2 residential

Reach Average Slope: approximate average slope for this reach is 0.009 (from Sta 447+07 to Sta 477+65.9)

1% Flow:

2000 cfs – Bollinger Road (Sta 447+07) to d/s Rodeo Creek (Sta 474+22.5)
1600 cfs – u/s Rodeo creek (Sta 475+17.4) to Blaney Avenue (Sta 478+28.9)

10% Flow:

1200 cfs – Bollinger Road (Sta 447+07) to d/s Rodeo Creek (Sta 474+22.5)
980 cfs – u/s Rodeo Creek (Sta 475+17.4) to Blaney Avenue (Sta 478+28.9)

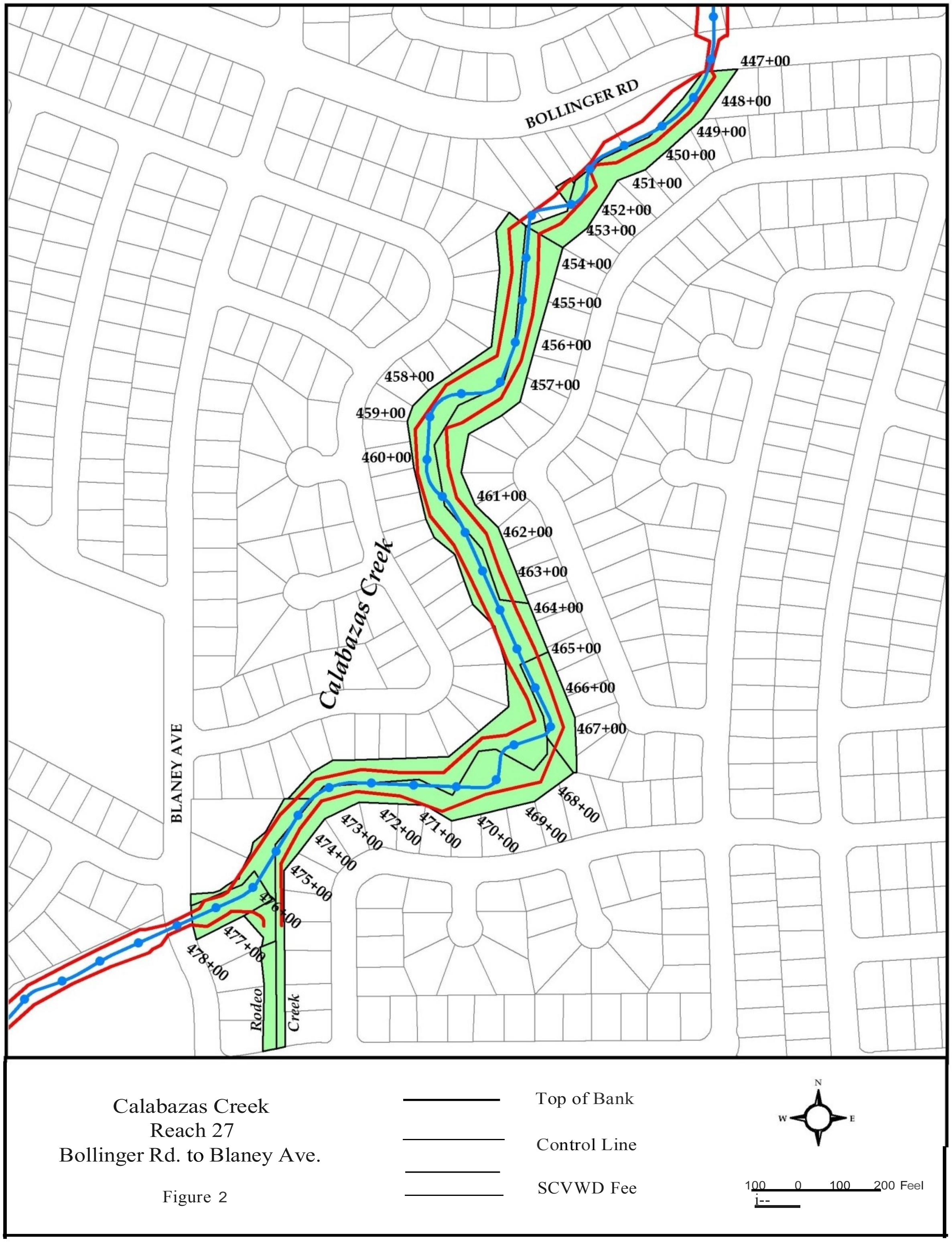
Current Reach Capacity: This reach has the capacity to convey 1% flow (2000 cfs-1600 cfs) from Upstream of Blaney Avenue to upstream of Bollinger Road.

Reach Flooding area Profiles: No flooding issues exist within this reach.

Reach Roughness Coefficient: The reach roughness coefficient (Manning's "n" value) is calculated, see Calabazas Creek Manning's "n" value Report.

Reach Typical Photos: See the following pages for typical photos and their channel descriptions. Pagination of photos is 27-1 to 27-11. For location and stationing see Figure 2.

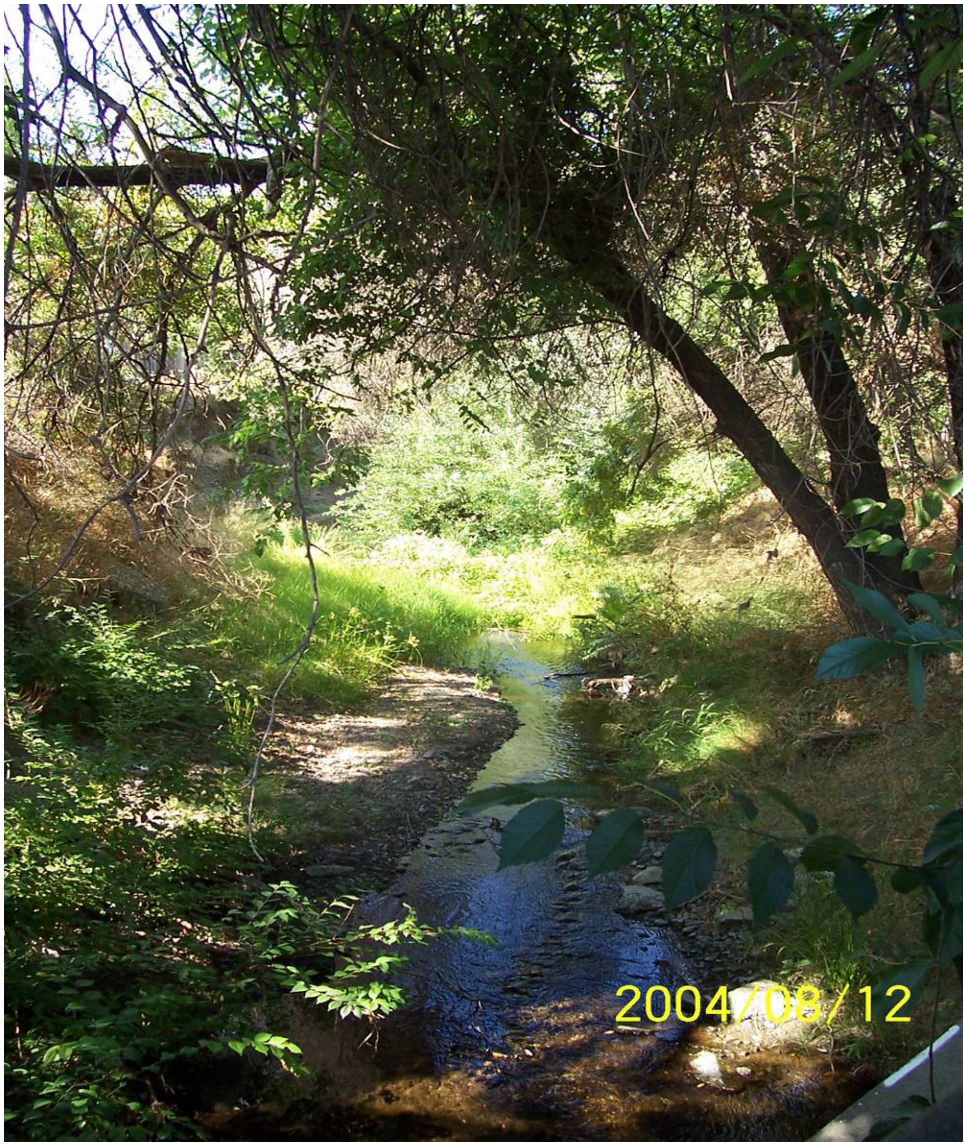
Reach Erosion Problem: Spot erosion occurs in this reach. See the following photos for the location and more details.



Calabazas Creek
Reach 27
Bollinger Rd. to Blaney Ave.

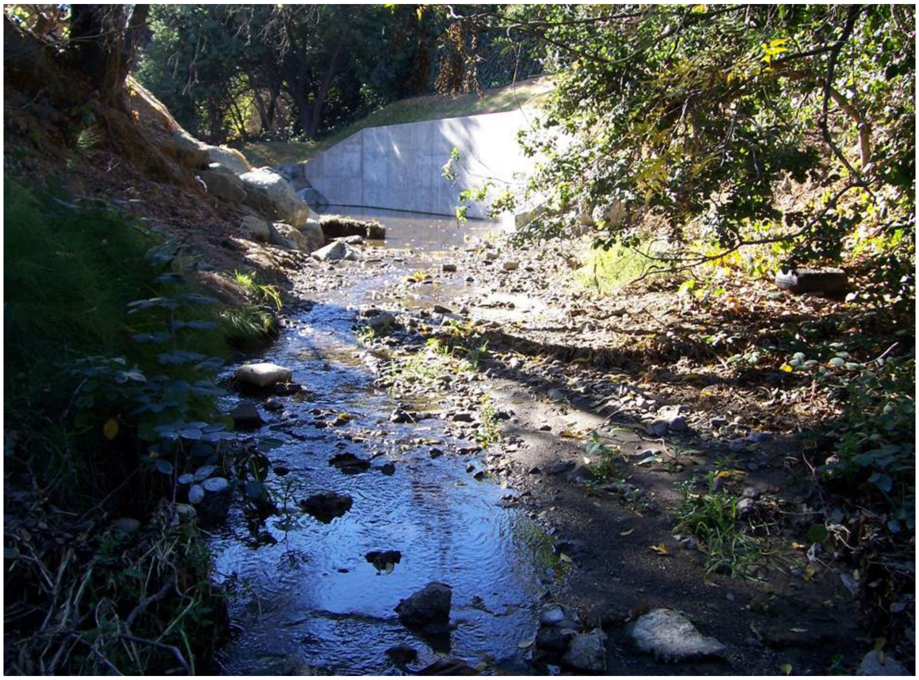
Figure 2

CALABAZAS CREEK

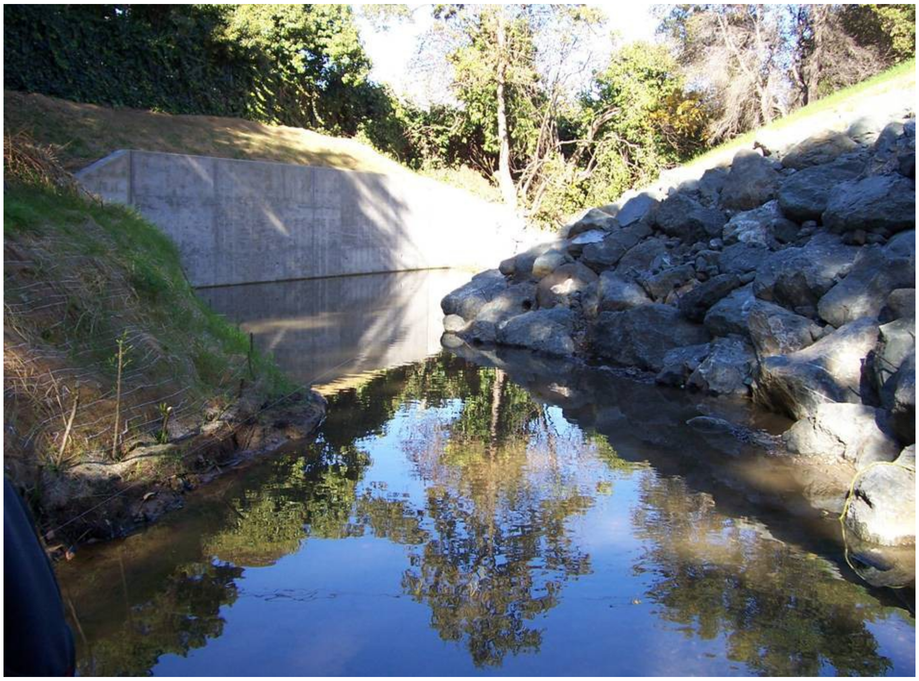


Looking Upstream, upstream of Bollinger Bridge as of October 2004 (STA 447+84)

CALABAZAS CREEK

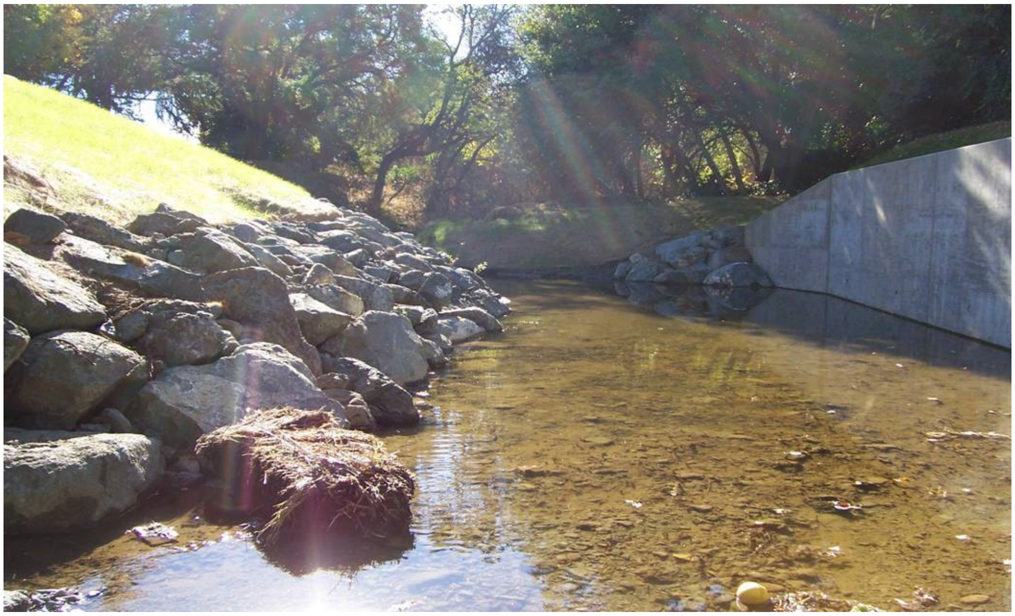


Looking Upstream, downstream of removed Old Bollinger Bridge

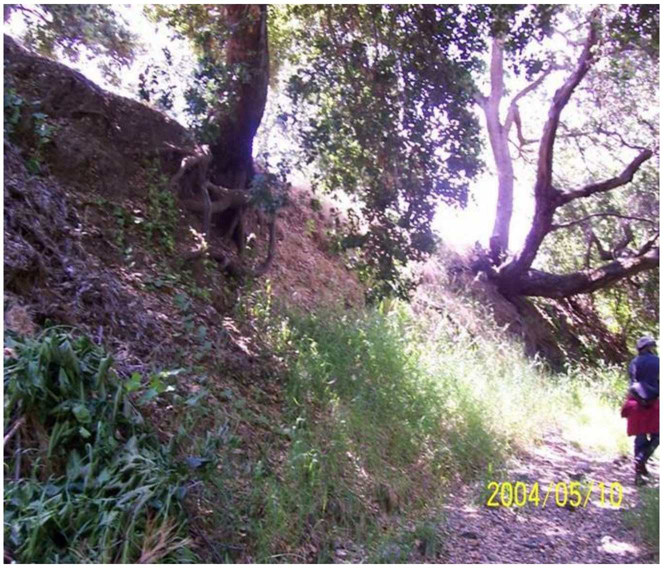


Looking Downstream, upstream of removed abandoned Old Bollinger Bridge

CALABAZAS CREEK

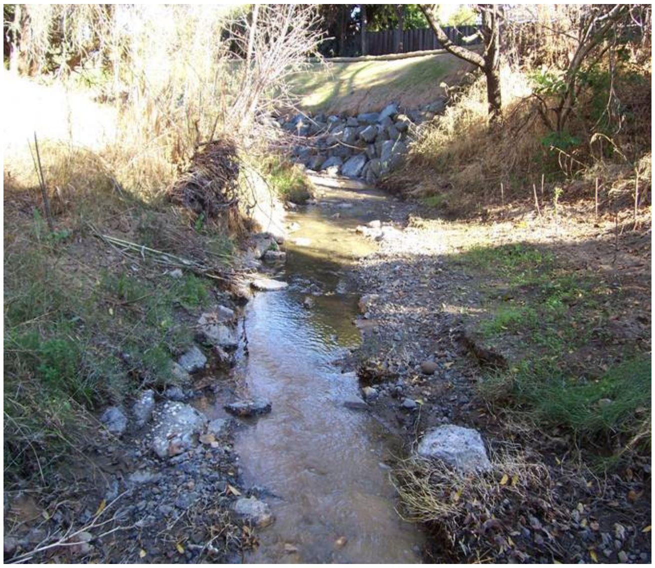


Upstream at site where old Bollinger Bridge was removed



2004/05/10

Looking upstream

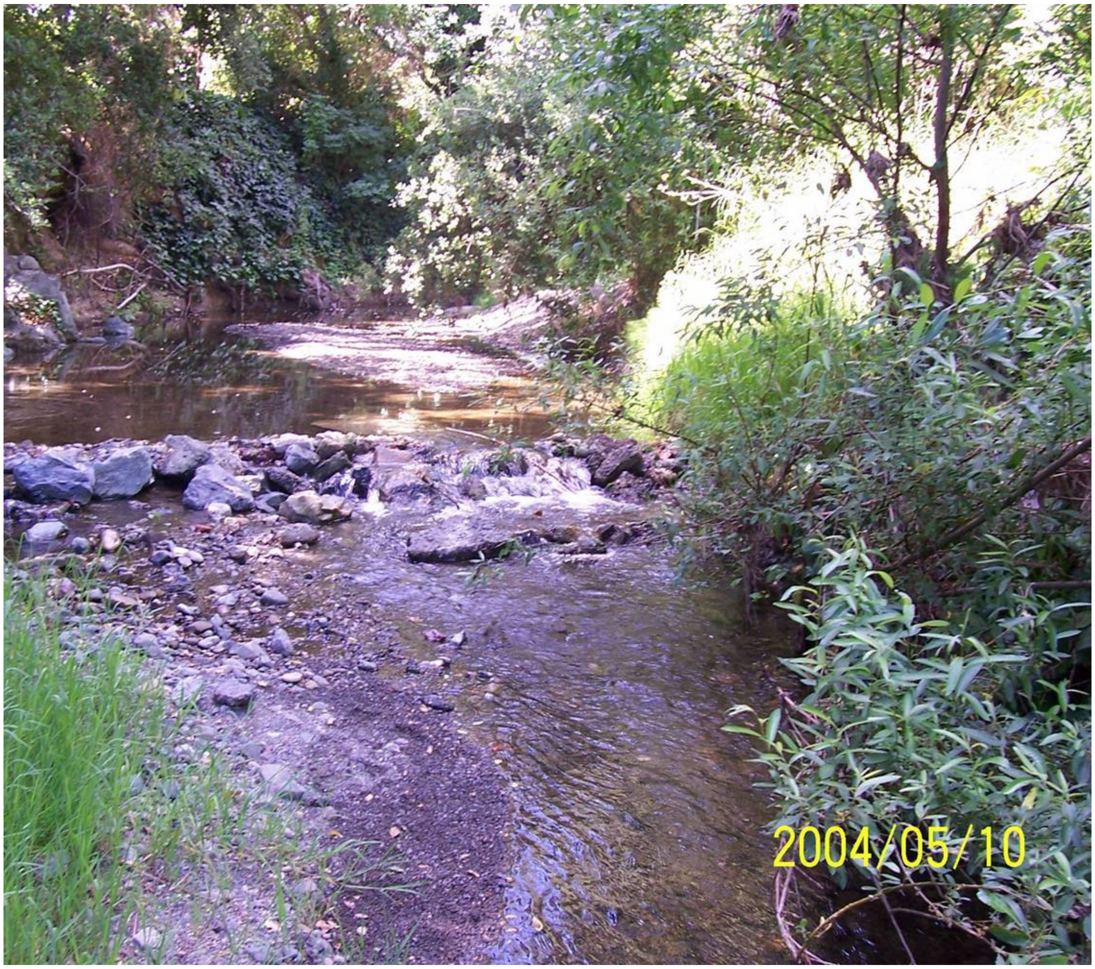


Looking downstream

Channel Description:

The channel is a curved trapezoidal channel. Immediately upstream of removed old Bollinger Bridge and left bank slope is covered with big rocks, and concrete retaining wall on the right bank. Further upstream it is a natural earth channel with bed material of firm soil on both bank slopes. Left bank is covered with bare soil and very few mature trees.

CALABAZAS CREEK



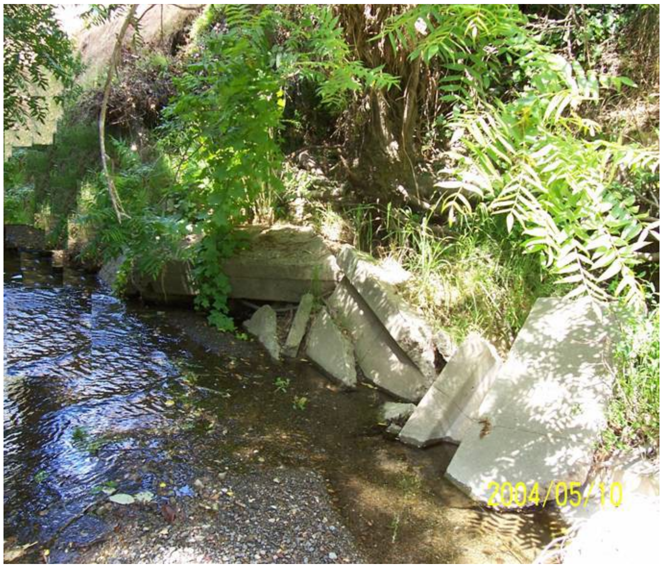
Looking Upstream (STA 456+58)

Channel Description:

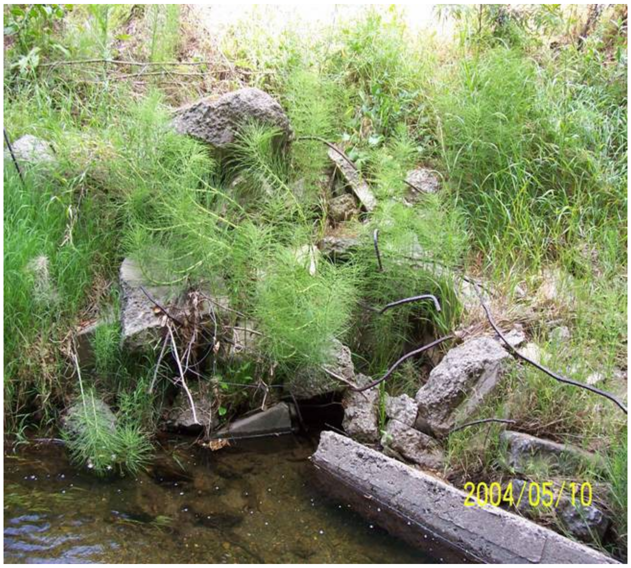
A trapezoidal earth channel, fairly vegetated on both banks with big and small trees and some undergrowth vegetation. Bottom width is relatively wide covered with rock rip rap and sediment deposition in some areas.

CALABAZAS CREEK

Left bank (STA 456+98)



Right bank (STA 457+87)



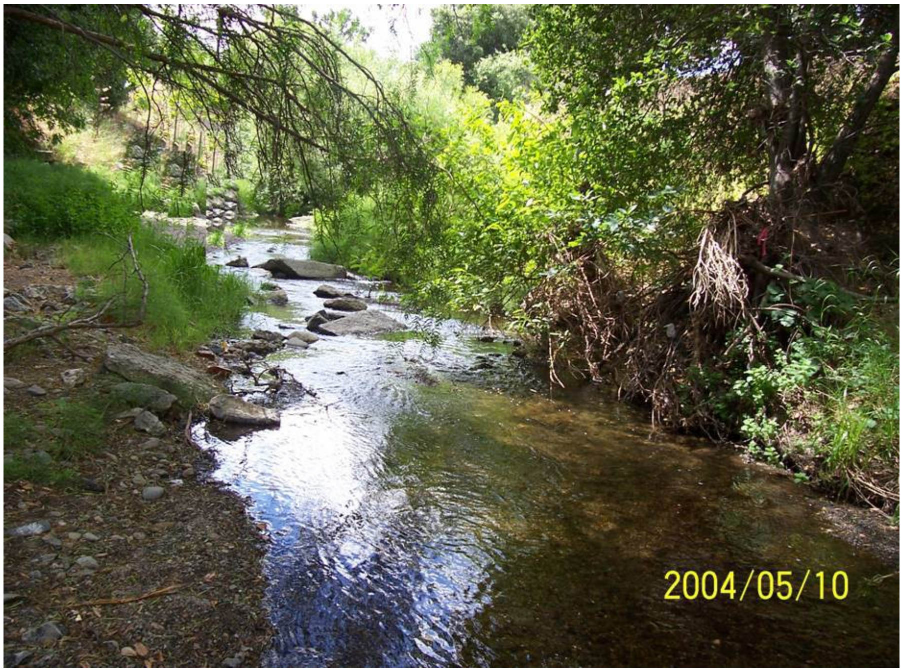
Right bank (STA 459+30)

Right bank (STA 459+74)

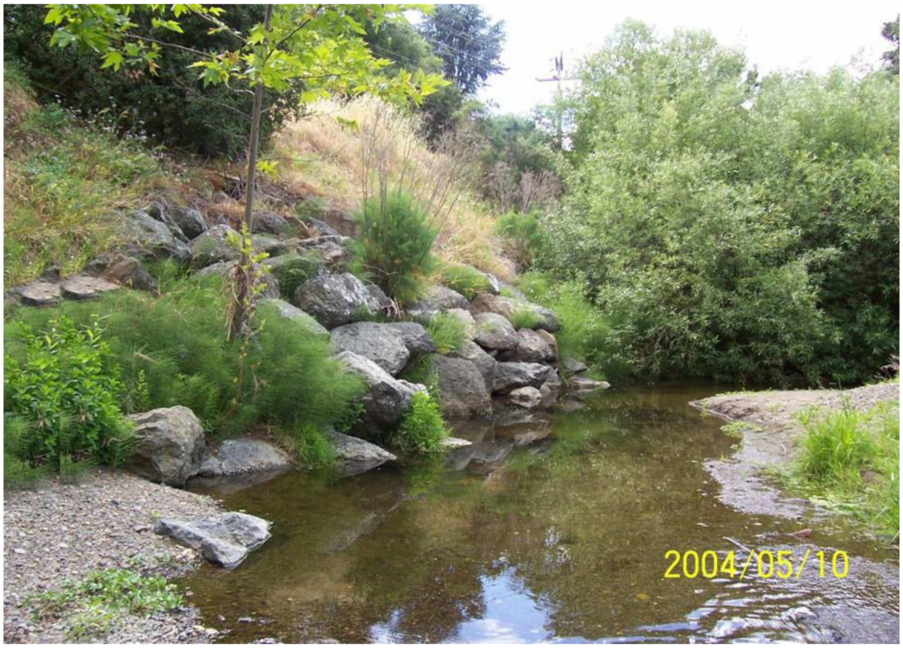
Channel Description:

The channel is a straight to slightly sinuous trapezoidal channel. In some areas the toes are protected by rocks and reinforced concrete pieces. Bank slopes are covered with some grass, ivy and some mature trees on top of the banks.

CALABAZAS CREEK



Looking Upstream (STA 465+35)

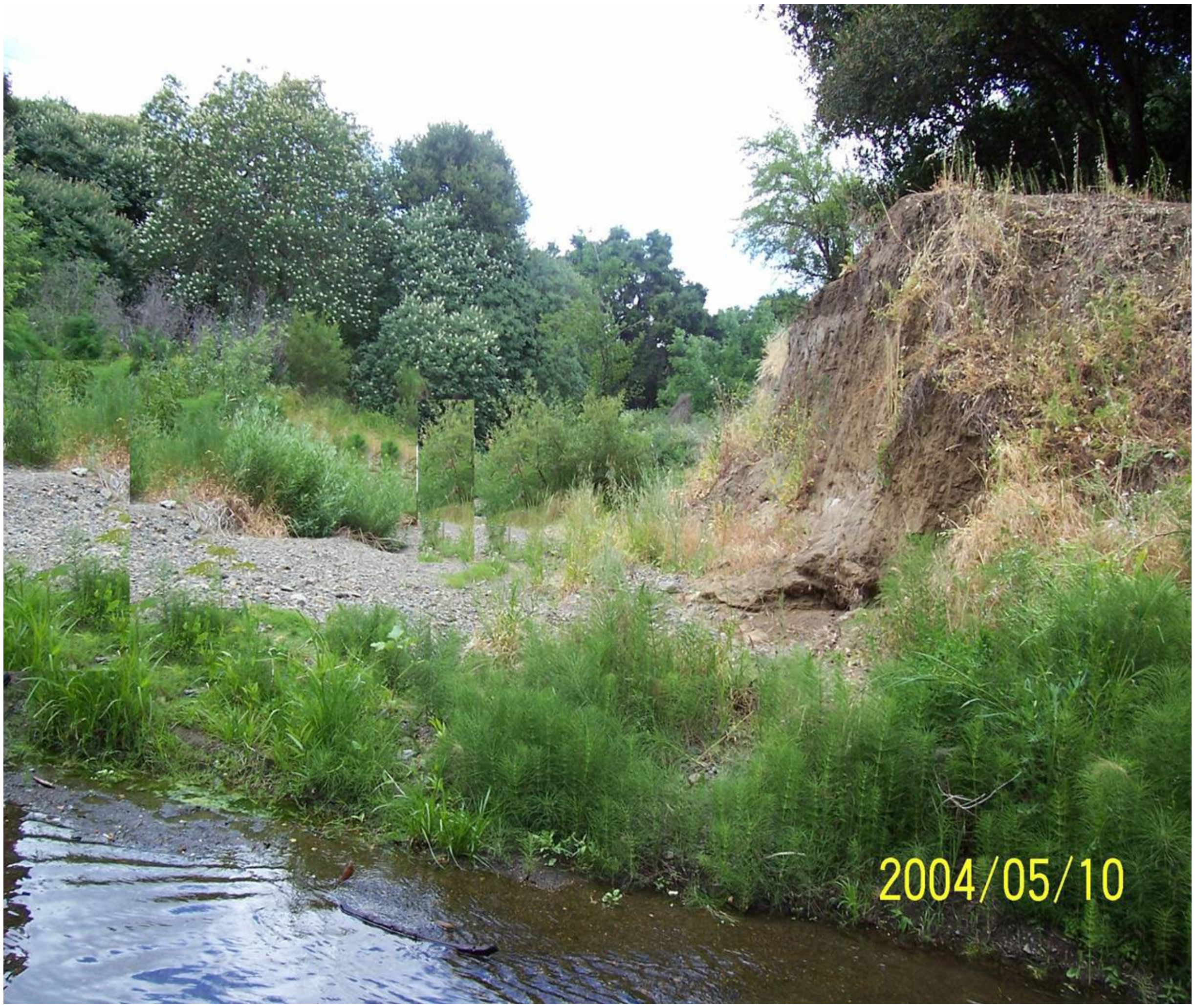


Looking Upstream (STA 466+65)

Channel Description:

The channel is a natural trapezoidal straight and meanders at the end. Invert consists of sediment deposition and some piece of rocks. Bank slopes are covered with mature and small trees in some area and bare soil with some rocks in the other.

CALABAZAS CREEK

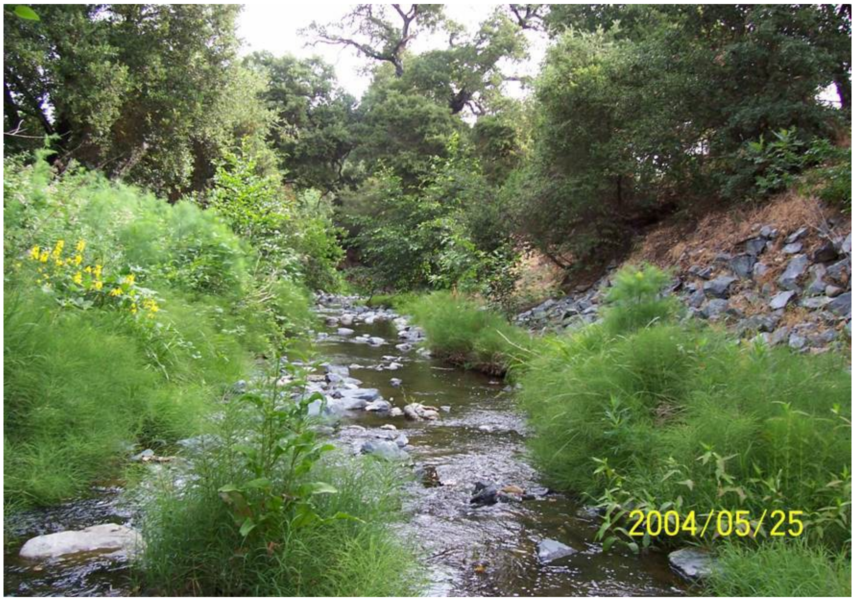


Looking Upstream (STA 466+65)

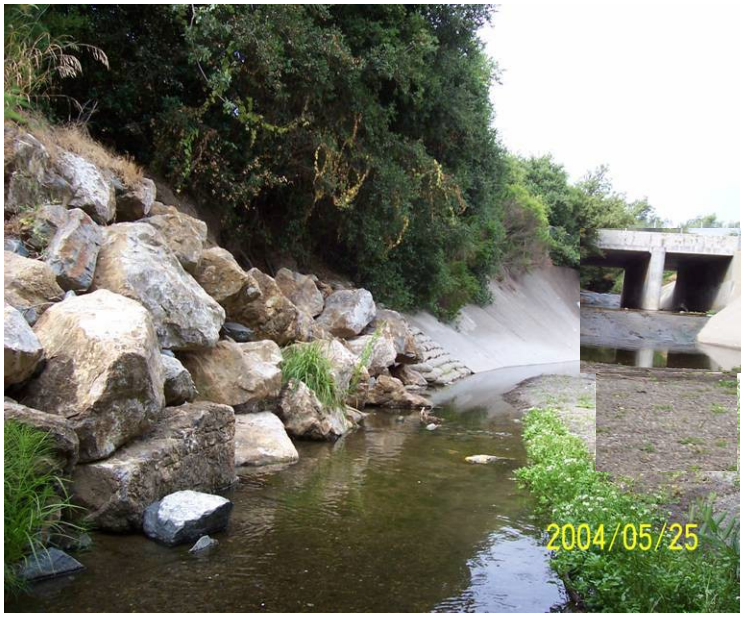
Channel Description:

A natural and curved channel. Very wide invert consists of sediment deposition covered with some undergrowth grass. West bank slope is eroded and east bank slope is fully vegetated with mature trees.

CALABAZAS CREEK



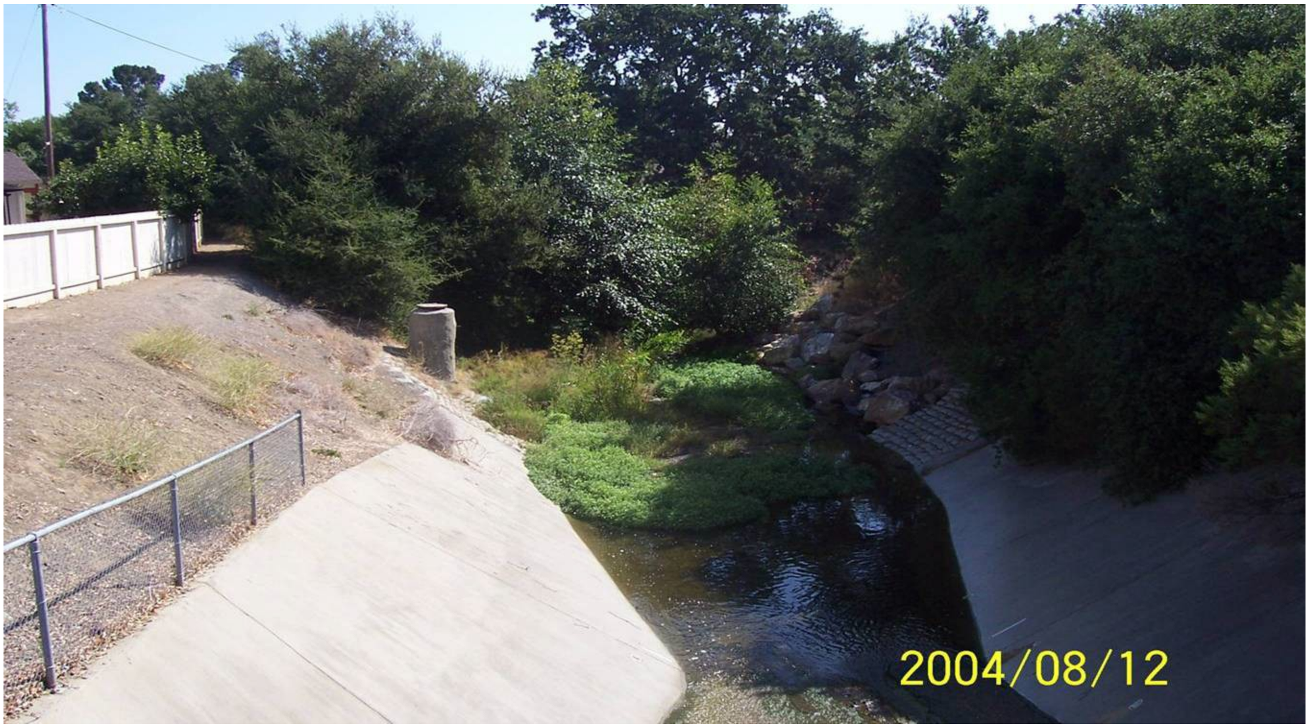
Looking Downstream (STA 476+00)



Looking Upstream, downstream of Blaney Avenue (STA 476+00)

Channel Description:

The channel is a natural trapezoidal with generally straight alignment. Very mature trees hang down from the top of the east bank. Bank slope is covered with bare soil and rock rip rap on the east bank and sack concrete on the west bank.



Looking Downstream, downstream of Blaney Avenue Culvert with concrete wing walls and sack concrete transition (STA 477+61) ±

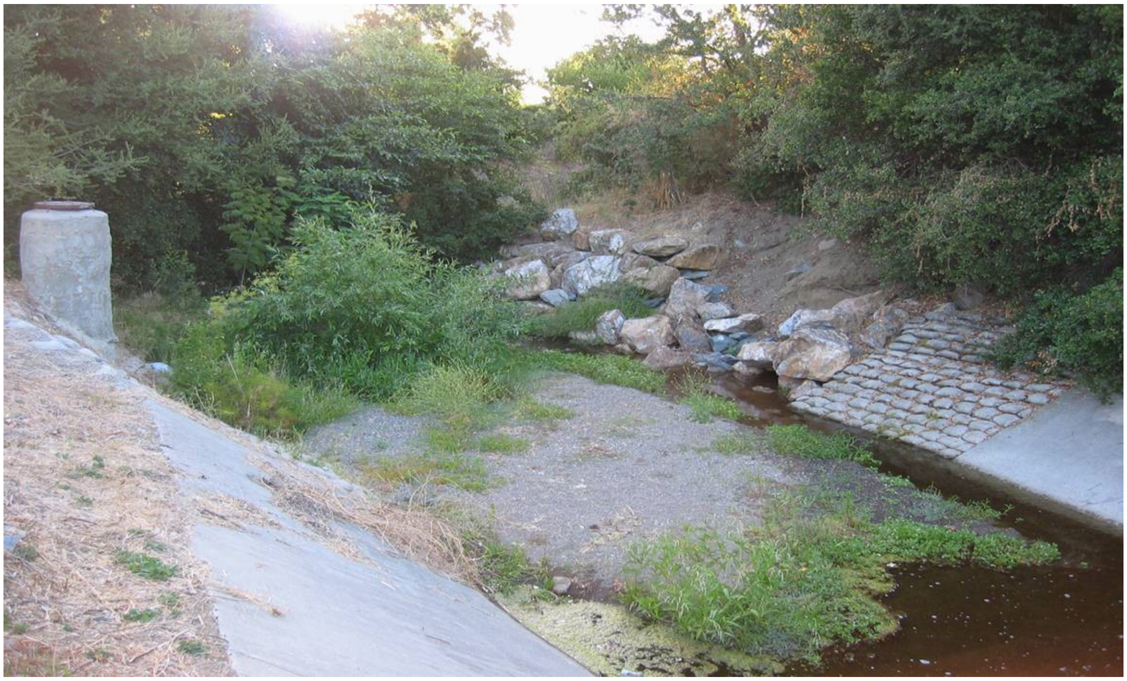
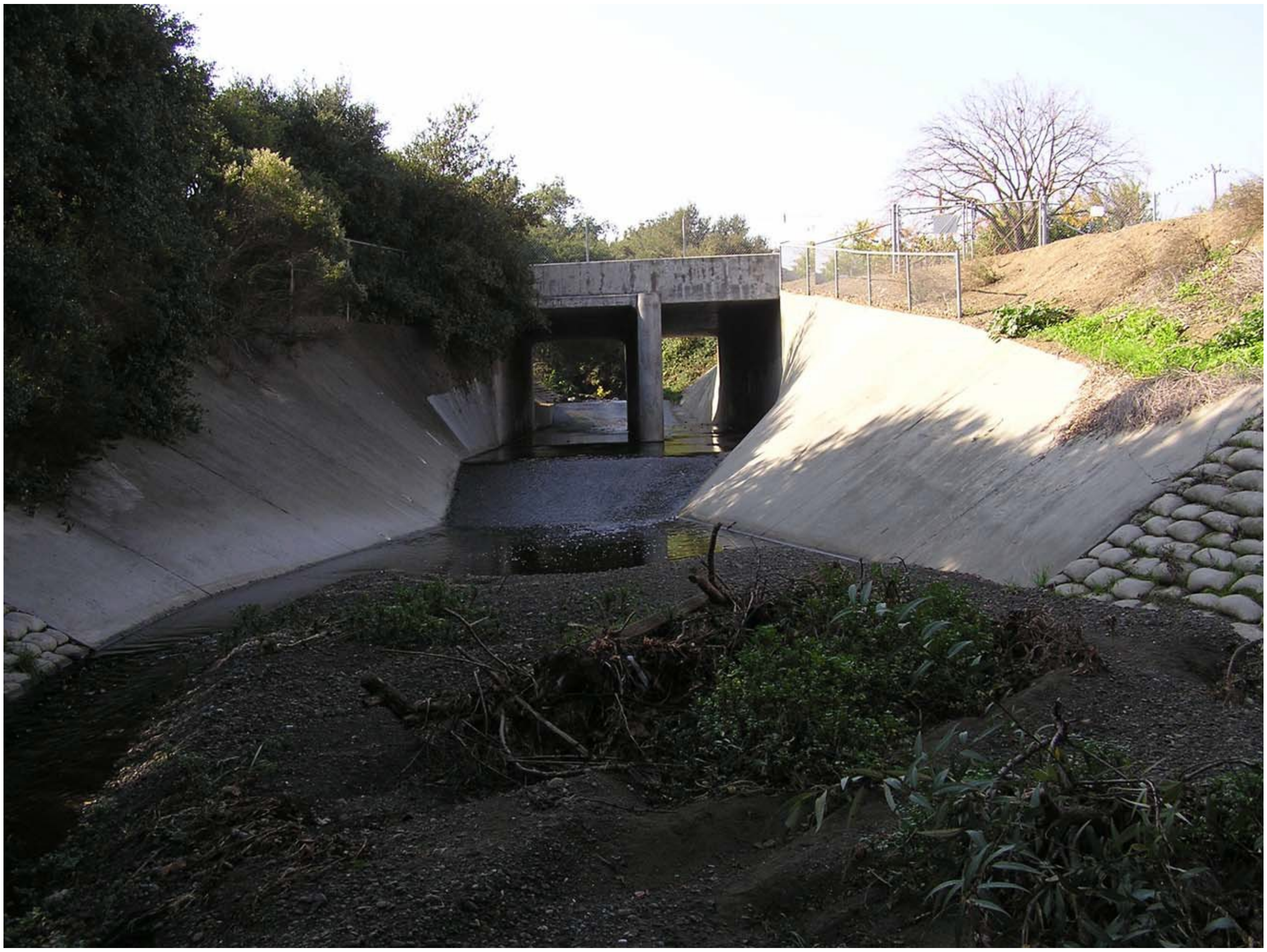


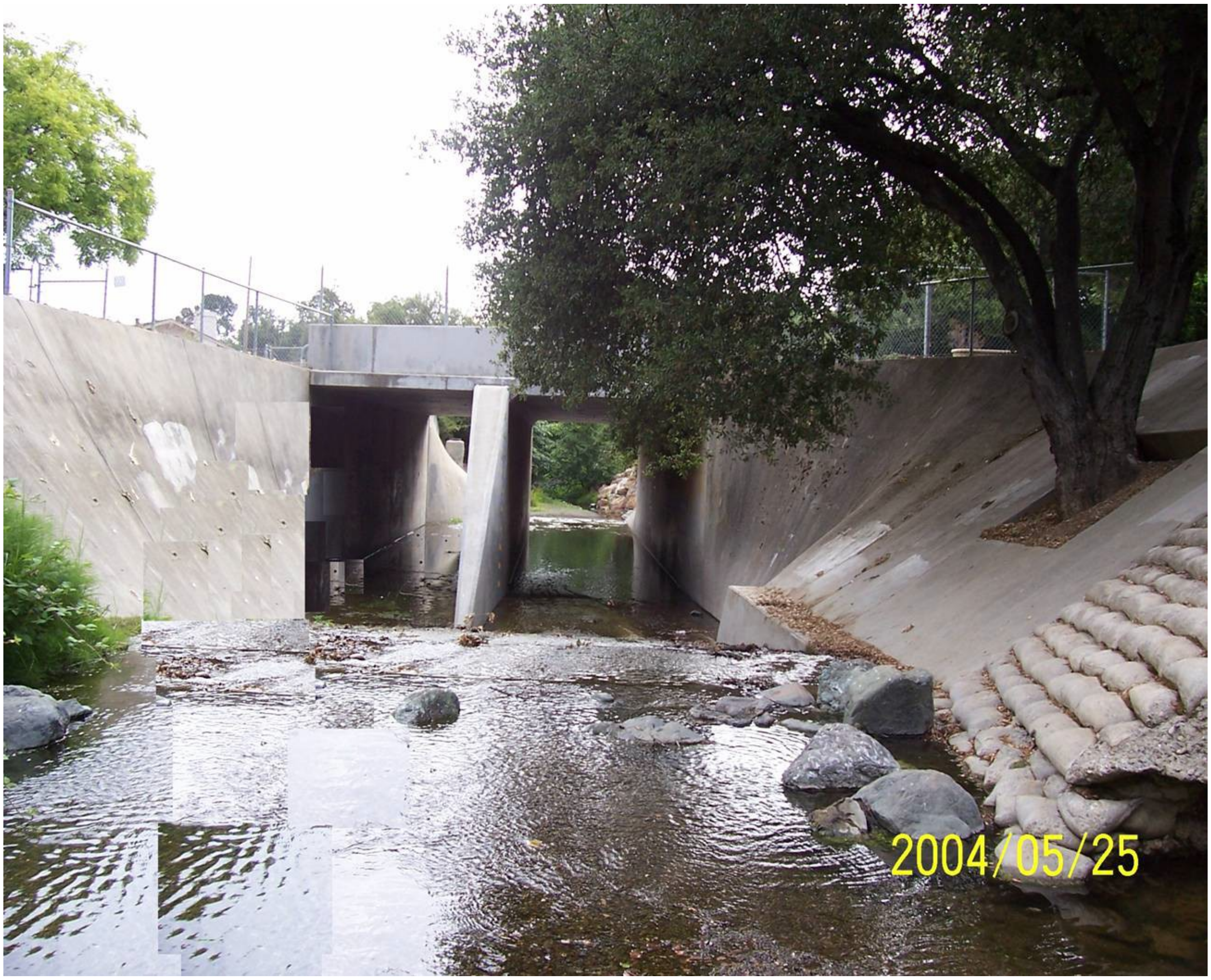
Photo taken from approximate STA 477+30 looking downstream from near Blaney Avenue showing a close up view of eroding rock slope protection on the left bank (looking upstream)

CALABAZAS CREEK



Looking Upstream, downstream of Blaney Culvert with concrete wing walls and sloped concrete invert (STA 476+63)

CALABAZAS CREEK



Looking Downstream, upstream of Blaney Avenue Culvert (STA 479+00) ±

REACH 28

Reach 28: **U**pstream of Blaney Avenue Culvert to upstream of Rainbow Drive Culvert (Sta 478+28.9 to Sta 493+96.5).

Reach Description:
The trapezoidal earth channel is primarily straight and consists of natural bank sections with spot channel erosion work. Sack concrete and geoweb bank protection was the method of bank stabilization at these spot channel erosion protection sites. Sack concrete sections are trapezoidal and located downstream of Rainbow Drive. Channel invert material consists of gravel and small cobbles. The east and west banks are covered with mature trees on top of the banks and eroded bare soil on both bank slopes.

Rainbow Drive Culvert is a 109 feet long double box culvert. Each box about 12 feet in width. Access to the creek at Rainbow Drive is limited to 1 locked chain link pedestrian gate on each side of the street.

The entire southeast bank of this reach is adjacent to a City of San Jose park (Calabazas Park). The northwest side is lined only with residential single family dwellings. Distinctive features in this reach include the City Park and a large 4 feet diameter outfall located near Rainbow Drive.

Reach Right-of-Way: The District possesses enough right-of-way within this reach. This right of way will be used on a feasible alternative for flooding location. Refer to Figure 3 for details.

Reach 28 Average Invert Slope: Approximate average slope for this reach is 0.0091 (from Sta 478+28.9 to Sta 492+87.3)

1% Flow:
1600 cfs – Blaney Avenue (Sta 478+28.9) to Outfall d/s Rainbow Drive (Sta 491+81.6)
1540 cfs –Outfall d/s Rinbow Drive (Sta 492+26.4) to u/s Rainbow Drive (Sta 493+96.5)
10% Flow:
980 cfs - Blaney Avenue (Sta 478+28.9) to Outfall d/s Rainbow Drive (Sta 491+81.6)
920 cfs – Outfall d/s Rinbow Drive (Sta 492+26.4) to u/s Rainbow Drive (Sta 493+96.5)

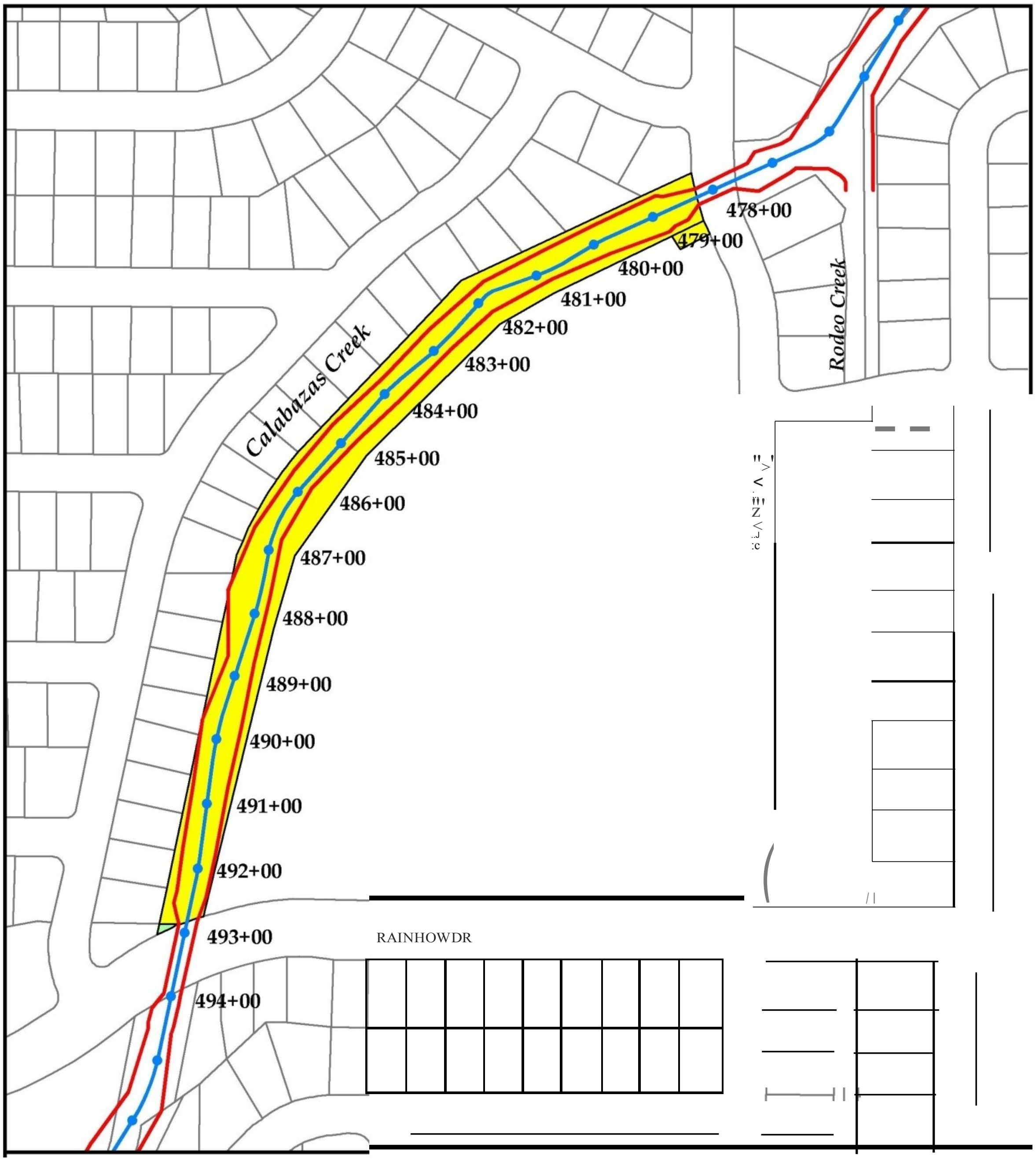
Current Reach Capacity: Between Sta 488+72.7 and Sta 486+77.5 9Around Calabazas Park the current channel capacity is 1468 cfs. The rest of the reach has the capacity to convey 1% flow (1600 cfs – 1540 cfs) from upstream of Rainbow Drive to upstream of Blaney Avenue. The range of water surface elevation above the top of the bank for this area is between .1’- .5’.

Reach Flooding area Profiles: See Appendix C, Hydraulic Report (Floodwater Breakout Points map and Profile 1 for flooding area). Flooding will occur around Calabazas Park for 200 feet, but City of San Jose is upgrading the Park.

Reach Roughness Coefficient: The reach roughness coefficient (Manning’s “n” value) is calculated, see Calabazas Creek Manning’s “n” value Report.

Reach Typical Photos: See the following pages for typical photos and their channel descriptions. Pagination of photos is 28-1 to 28-7. For location and stationing see Figure 3.

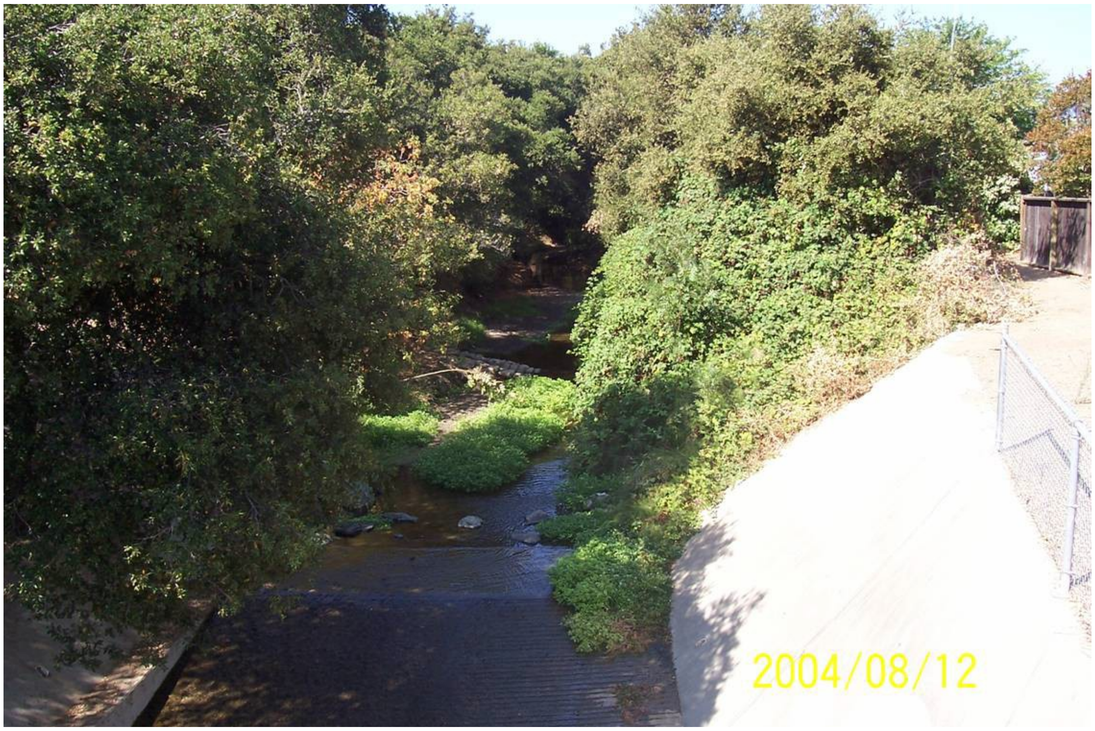
Reach Erosion Problem: Significant spot erosion occurs in this reach. See the following photos for the location and more details.

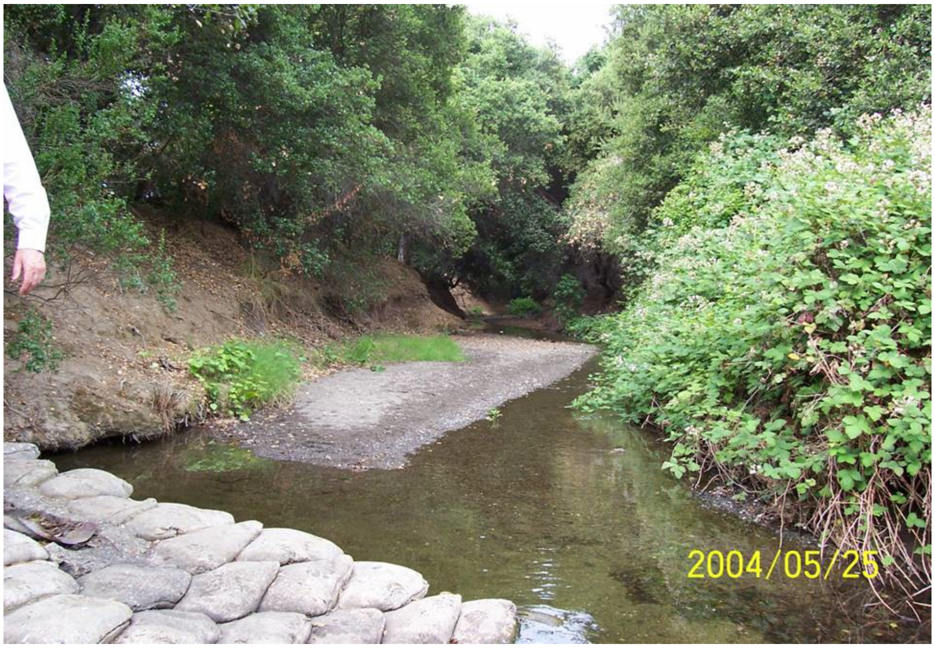


Calabazas Creek
Reach 28
Blaney Ave. to Rainbow Dr.

Figure 3

CALABAZAS CREEK



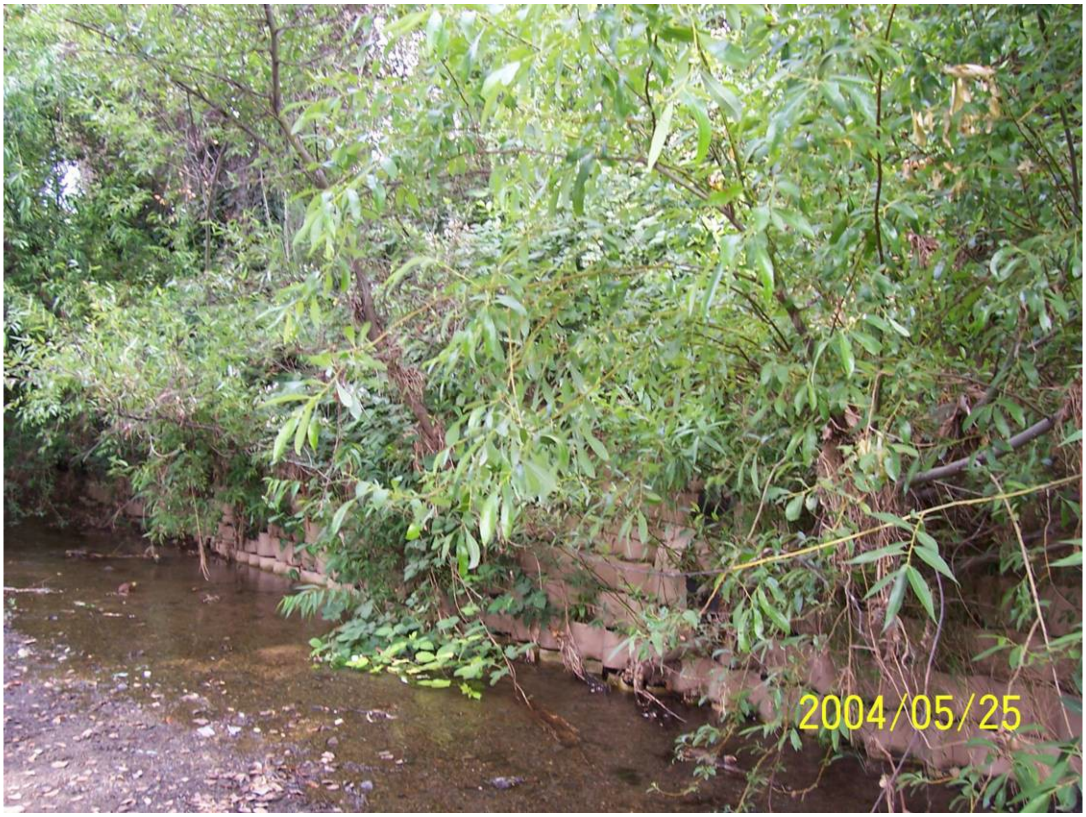


STA 479+10

Channel Description:

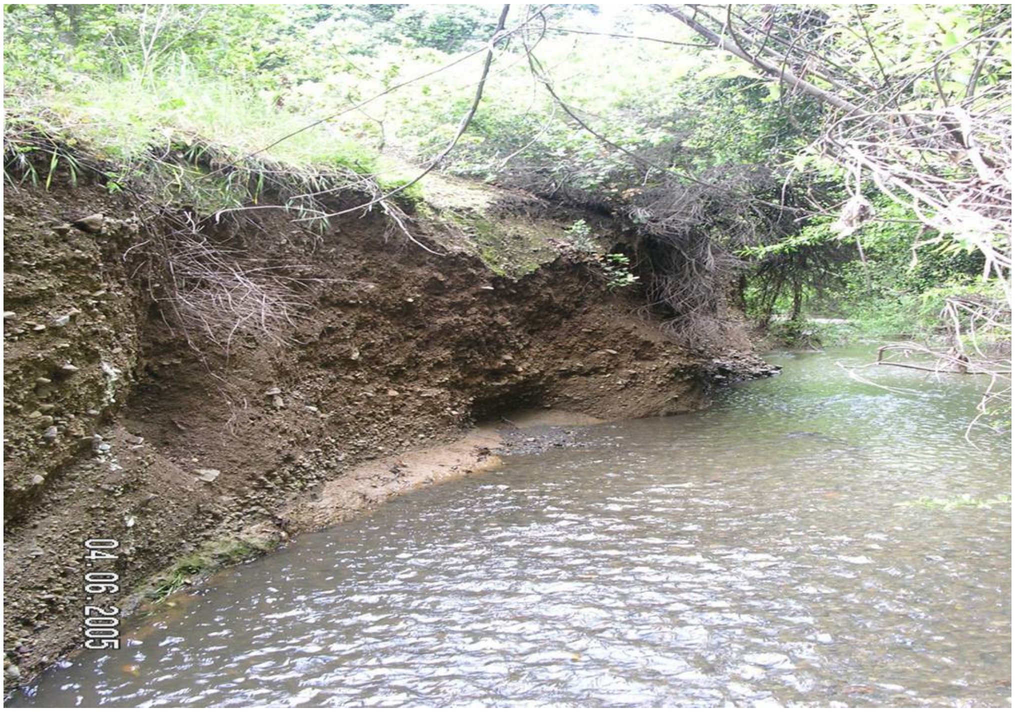
Earth trapezoidal shaped channel with mostly straight alignment. Looking upstream from upstream of Blaney Avenue Culvert. On the left bank immediately after concrete wing wall sacked concrete is located midway down the creek. Right bank slope and top of the left bank are fully vegetated with mature trees. Invert consists of some sediment deposition and bank slopes are covered with firm soil.

CALABAZAS CREEK

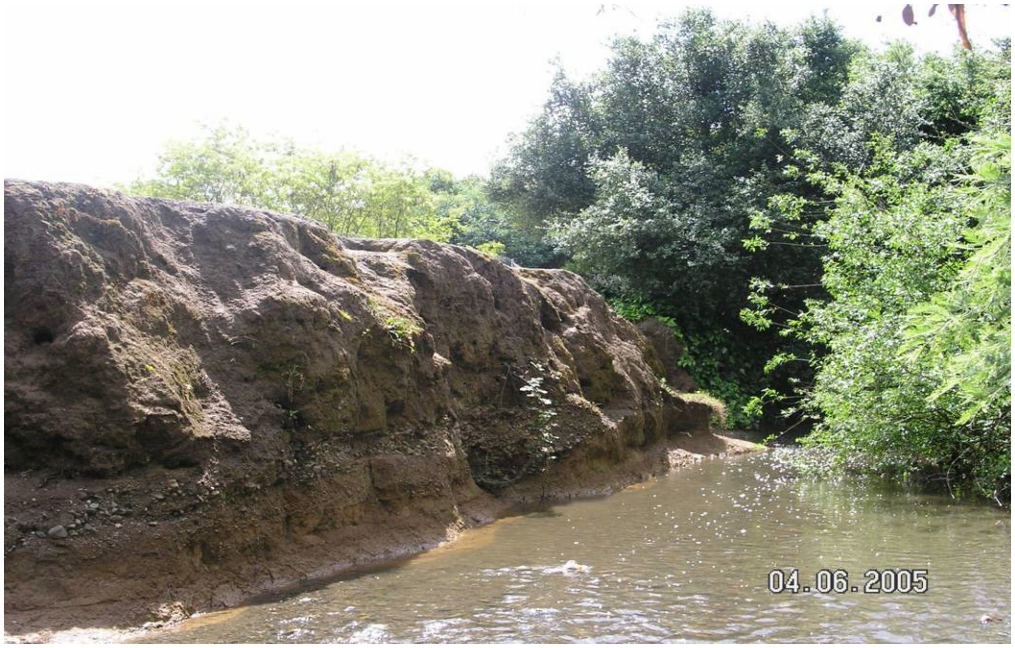


Looking Upstream, a geoweb retaining wall on the east bank is covered with some small trees. Invert material is sandy and gravel. (STA 486+69)

CALABAZAS CREEK



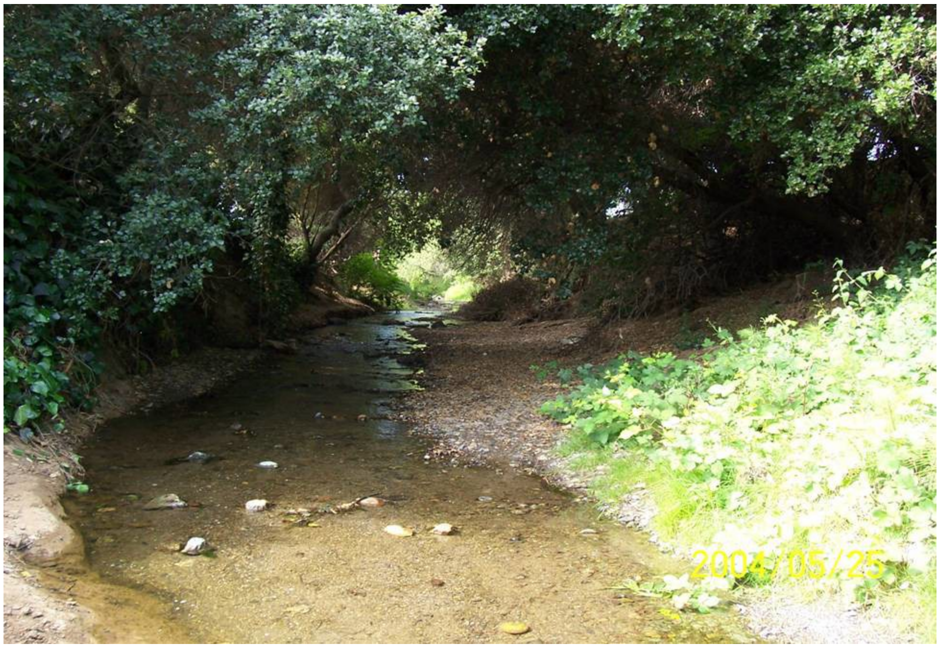
Looking Upstream, (STA 485+70)±



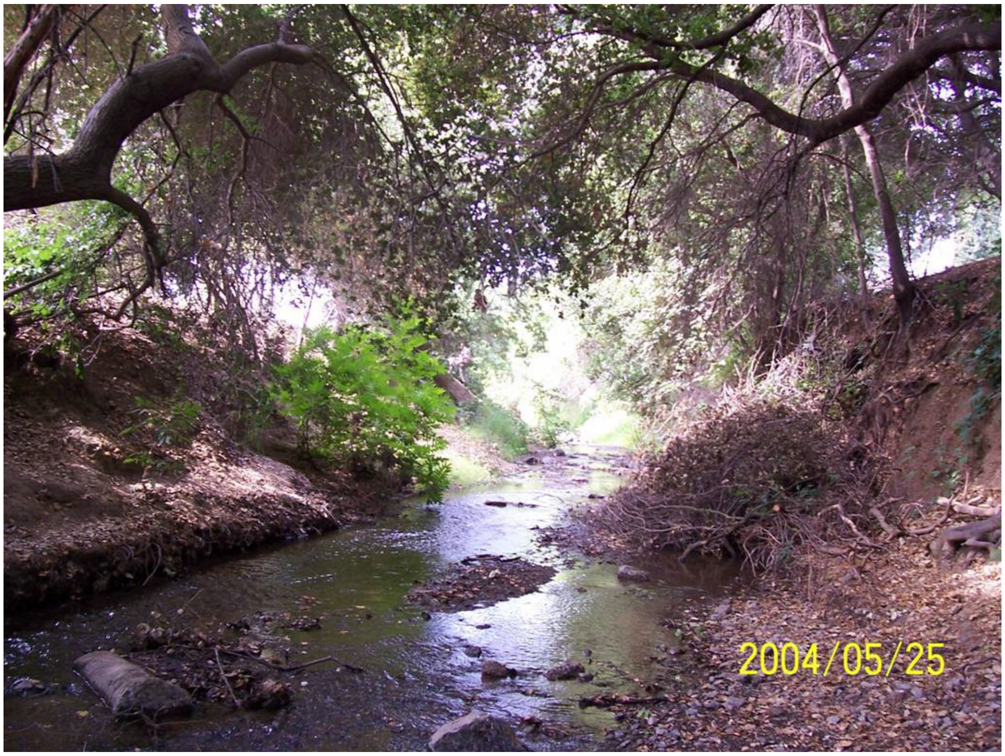
Looking Upstream, (STA 487+20)±

Looking Upstream, spot erosion occurs along Calabazas Creek adjacent to Calabazas Park

CALABAZAS CREEK



(STA 488+00)

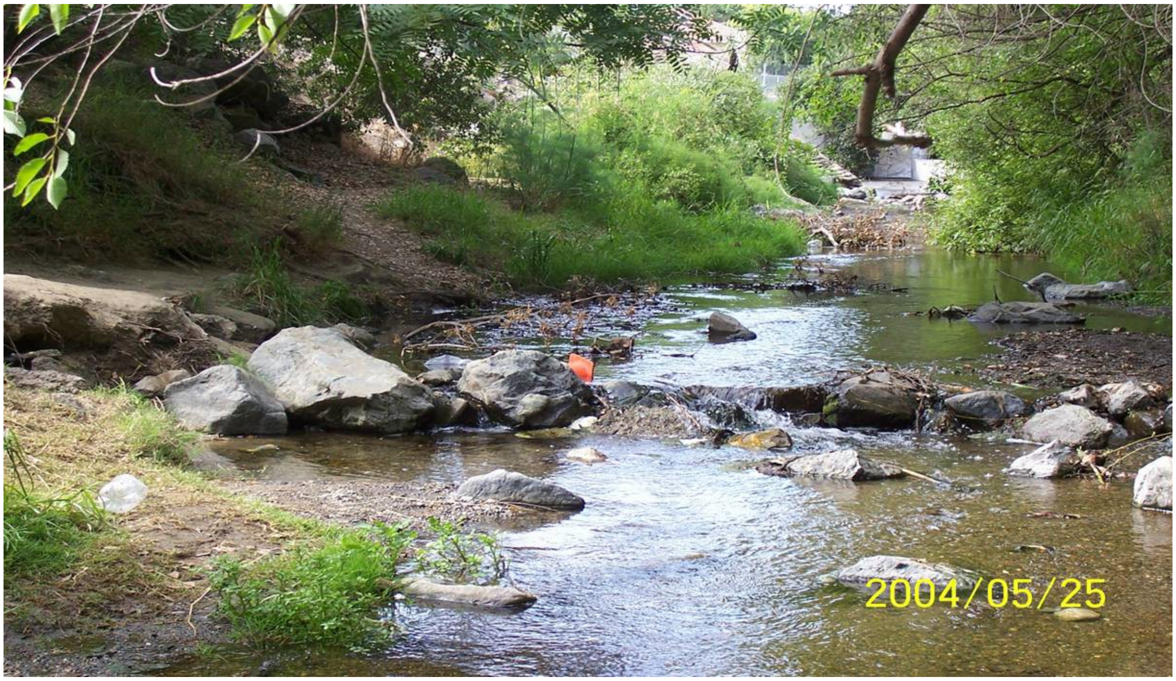


(STA 488+81)

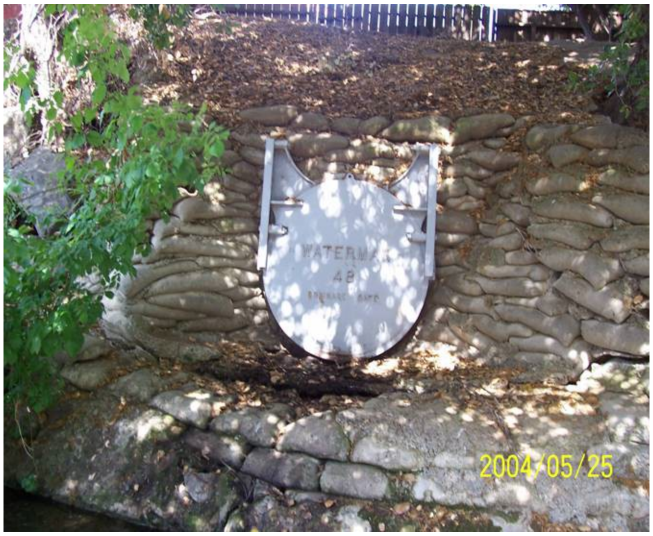
Channel Description:

Very wide earth channel with straight to some meandering alignment. Channel invert consists of sediment deposition covered with undergrowth grass in some area. Some areas feature fully green mature trees on bank slopes and top of the banks and in other areas have dry big dead trees.

CALABAZAS CREEK

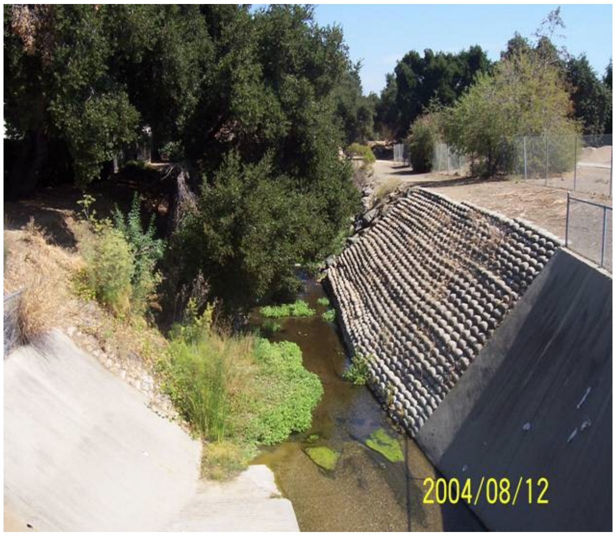

2004/05/25

Looking Upstream (STA 490+24)



2004/05/25

Looking Upstream, drainage flap gate surrounded by sloppy sack concrete located on the shallow right bank. (STA 491+78)

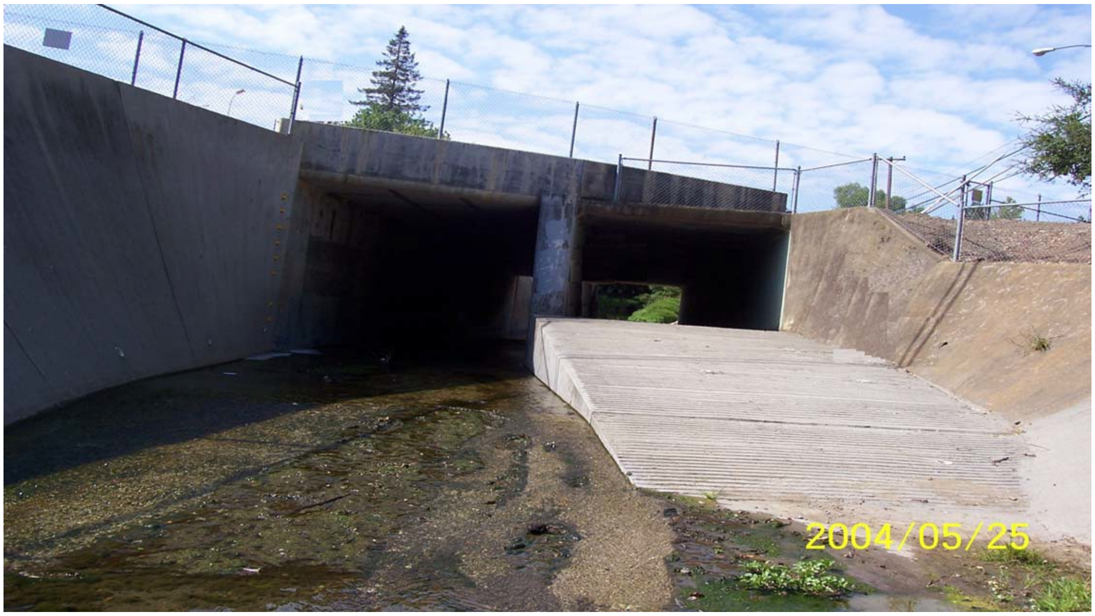

2004/08/12

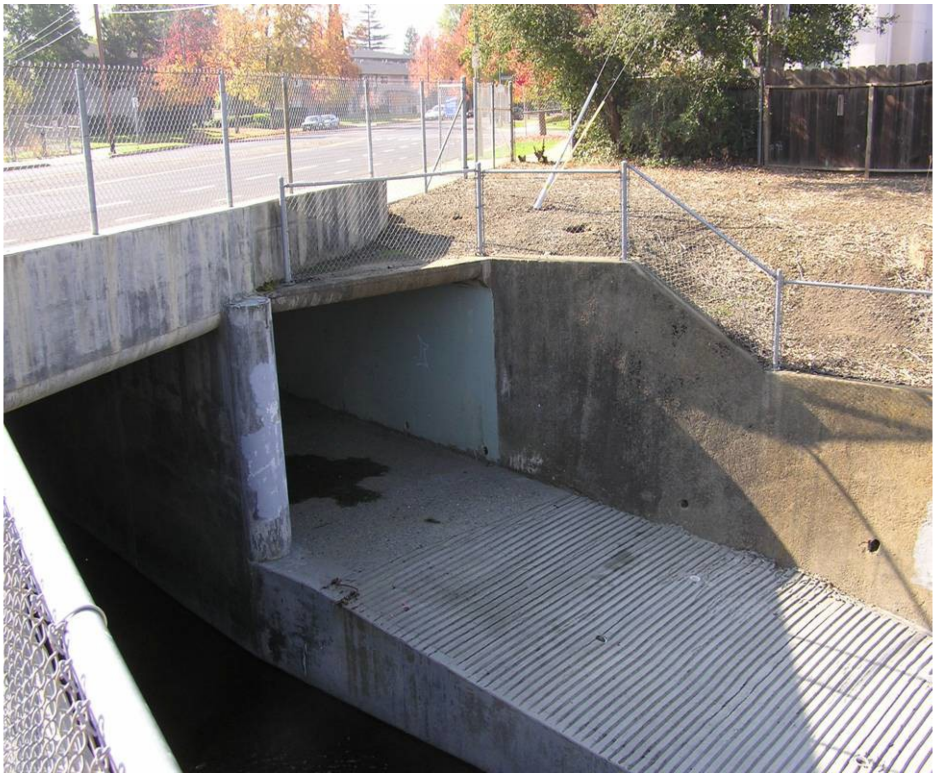
Looking Downstream from downstream of Rainbow Drive (STA 492+89)

Channel Description:

The channel is a trapezoidal earth channel with straight alignment. Channel invert consists of pieces of rock (rip rap), sand and concrete in some areas. Some mature trees are located on bank slopes where the bed consists of bare soil.

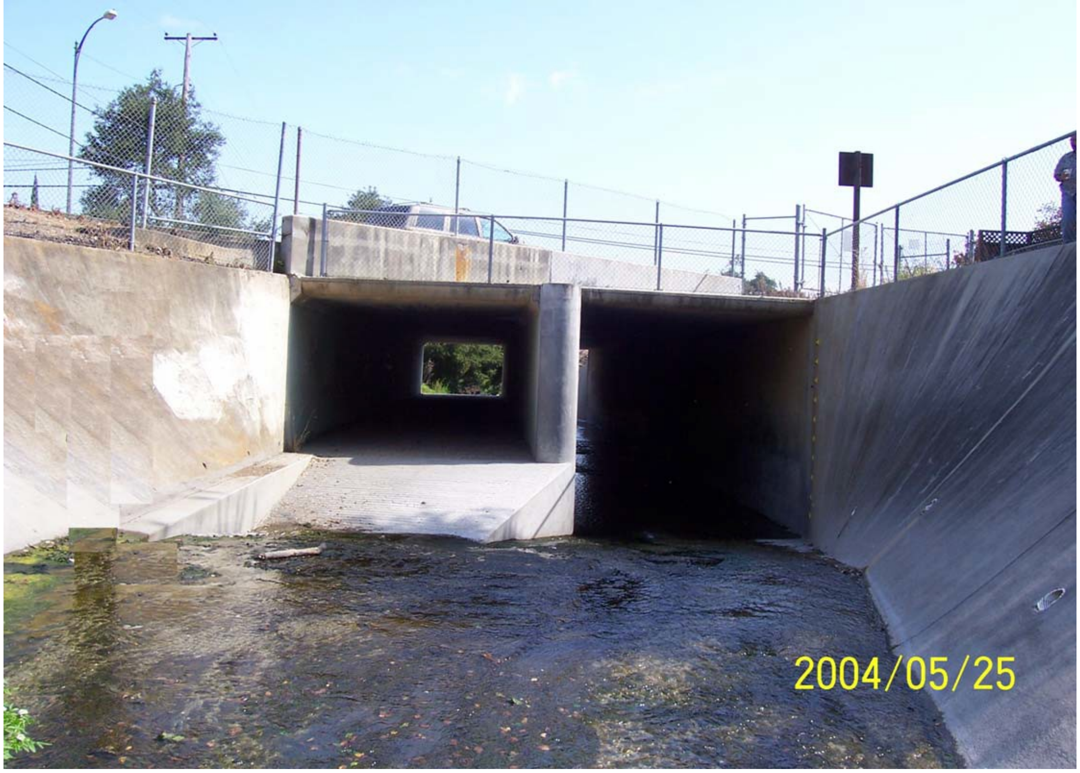
CALABAZAS CREEK

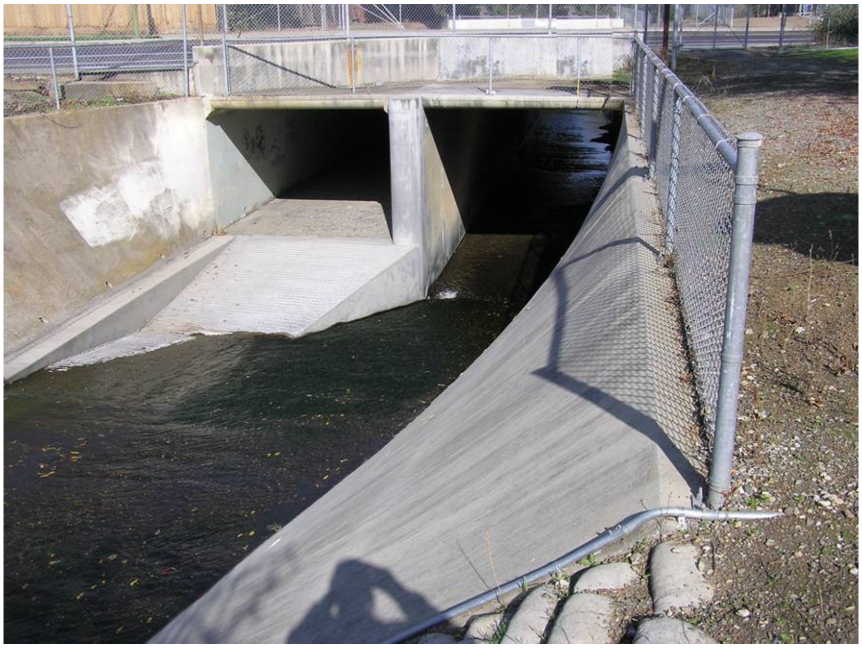

2004/05/25



Looking Upstream from downstream of the Rainbow Drive Culvert with concrete wing wall, sloped concrete invert conforms to the channel bottom. Left cell invert is approximately 2 feet lower than the right cell invert.

CALABAZAS CREEK


2004/05/25



Looking Downstream from upstream of the Rainbow Drive Culvert

REACH 29

Reach 29: Upstream of Rainbow Drive Culvert to upstream of HWY 85 Bridge (Sta 493+96.5 to Sta 511+92.8)

Reach Description:
This reach is an earth trapezoidal shaped channel with straight and some curve alignment. The channel invert is relatively wide, consisting of mainly gravel and cobbles. In some bank areas, the channel is heavily eroded with some mature trees on top of the banks. Sack concrete slope protection is located mostly on the west bank slope downstream of a pedestrian bridge and on the east bank slope upstream of the same bridge.

HWY 85 Bridge is a 503 feet wide clear span bridge. There is no access to the creek at HWY 85.

The entire reach is located in the City of San Jose. One distinctive feature in this reach is a pedestrian bridge located at 570 feet downstream of HWY 85.

Reach Right-of-Way: The District does not possess enough right of way at the locations shown in the following table. Refer to Figure 8 for details.

Table 3: Insufficient right of way location within reach 29

Reach	Beginning Station	Ending Station	Length	Properties where District has insufficient ROW
29	496+65	497+70	105	1 apartment complex
	498+80	500+45	165	
	501+85	502+20	35	
	503+85	504+90	105	

Reach Average Invert Slope: Approximate average slope for this reach is 0.013 (from Sta 493+96.5 to Sta 506+90)

1% Flow:

1900 cfs – Rainbow Drive (Sta 493+96.5) to downstream HWY85 (Sta 505+95.8)
1850 cfs – downstream HWY 85 (Sta 106+10) to upstream HWY 85 (Sta 111+13)

10% Flow:

960 cfs – Rainbow Drive (Sta 92+98) to downstream HWY85 (Sta 104+92)
920 cfs - downstream HWY 85 (Sta 506+90) to upstream HWY 85 (Sta 511+92.8)

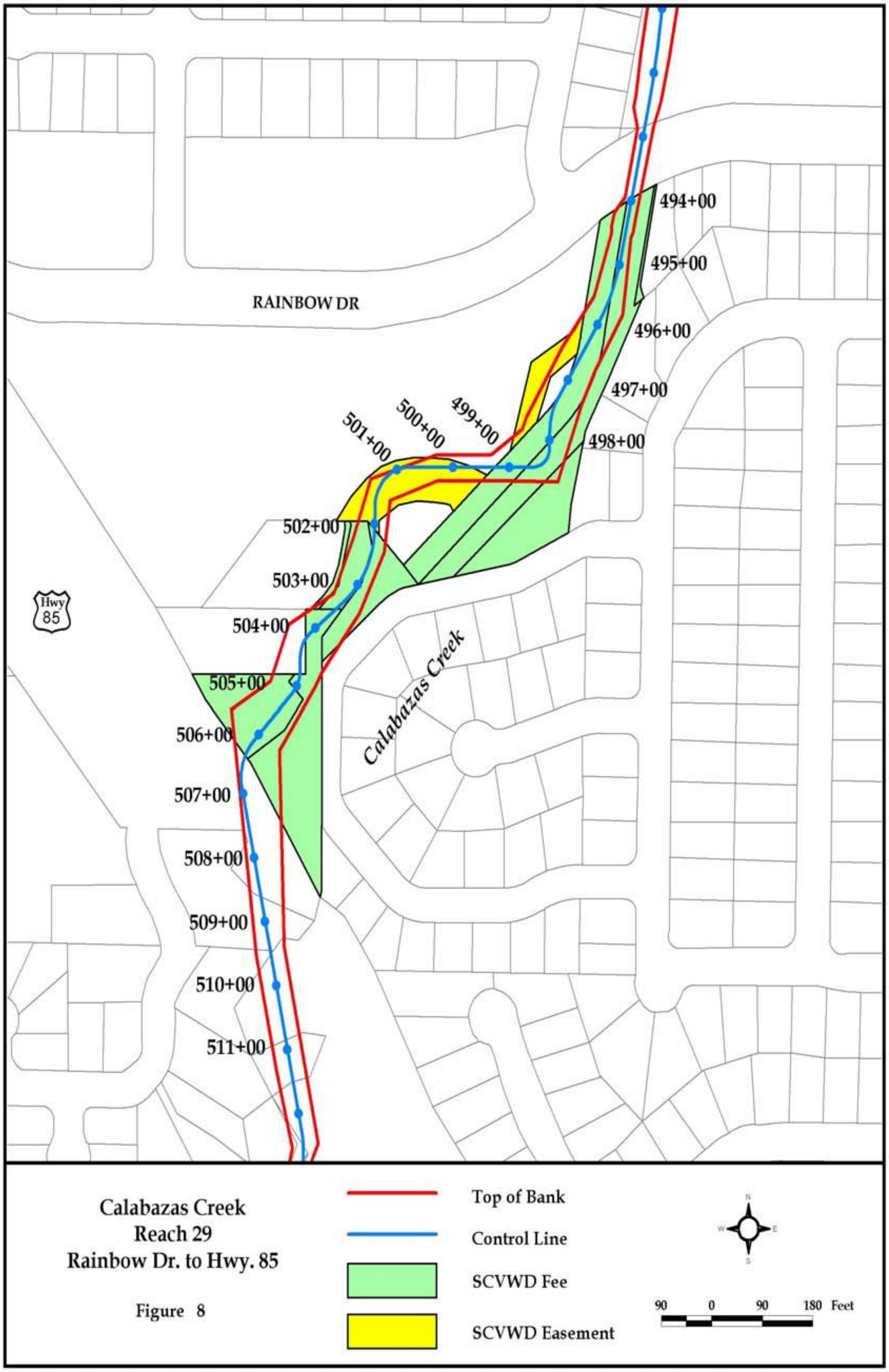
Current Reach Capacity: Between Sta 502+36 and Sta 499+31.1 the channel current capacity is 817 cfs. The reminder of the reach has the capacity to convey 1% flow (1900 cfs-1850 cfs) from upstream of HWY 85 to upstream of Rainbow Drive. The range of water surface elevation above the top of the bank for this area is between 0.4' – 2.4'.

Reach Flooding area Profiles: See Appendix A, Hydraulic Report (Floodwater Breakout Points map and Profile 2 for flooding area).

Reach Roughness Coefficient: For this report the roughness coefficient of .05 for natural channel, .044 for rock bed, and .036 for sack concrete was used. For areas with concrete material (bridges and wing walls and ect.) the roughness coefficient was .015.

Reach Typical Photos: See the following pages for typical photos and their channel descriptions. Pagination of photos is 29-1 to 29-7. For location and stationing see Figure 8.

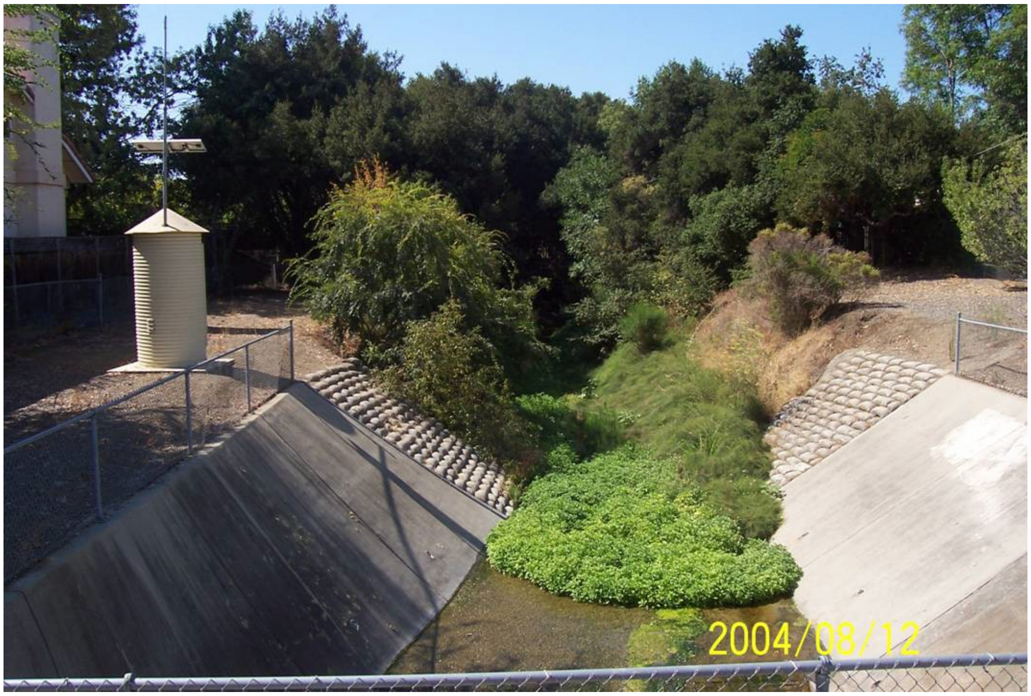
Reach Erosion Problem: Significant spot erosion occurs in this reach. See the following photos for the location and more details.



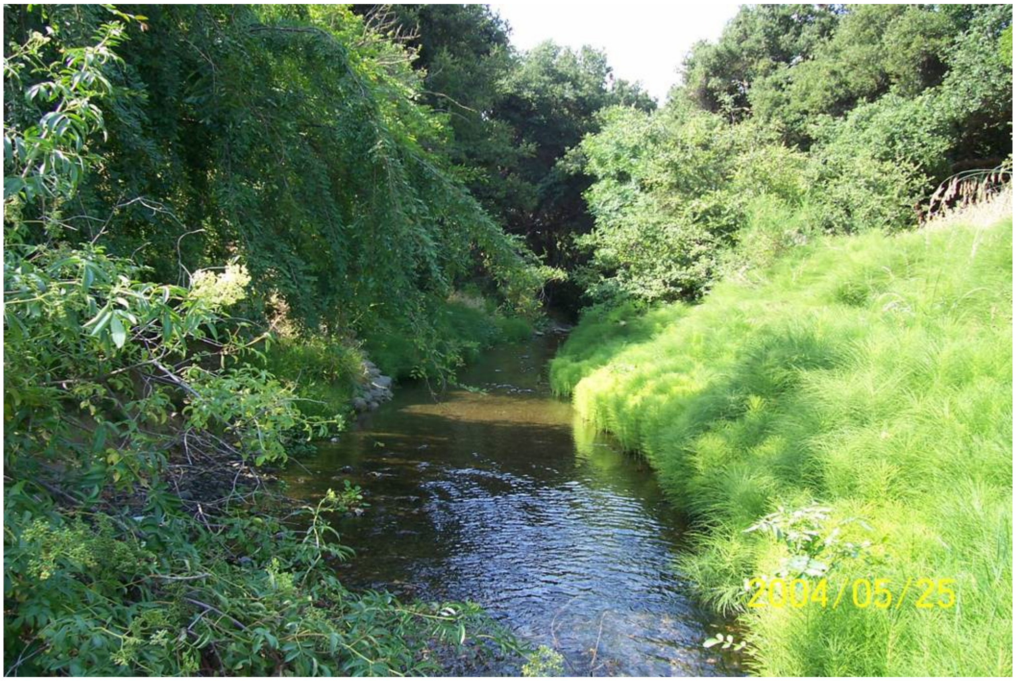
Calabazas Creek
Reach 29
Rainbow Dr. to Hwy. 85

Figure 8

CALABAZAS CREEK



Looking Upstream, a rain gage is seen on the left bank (STA 493+92)

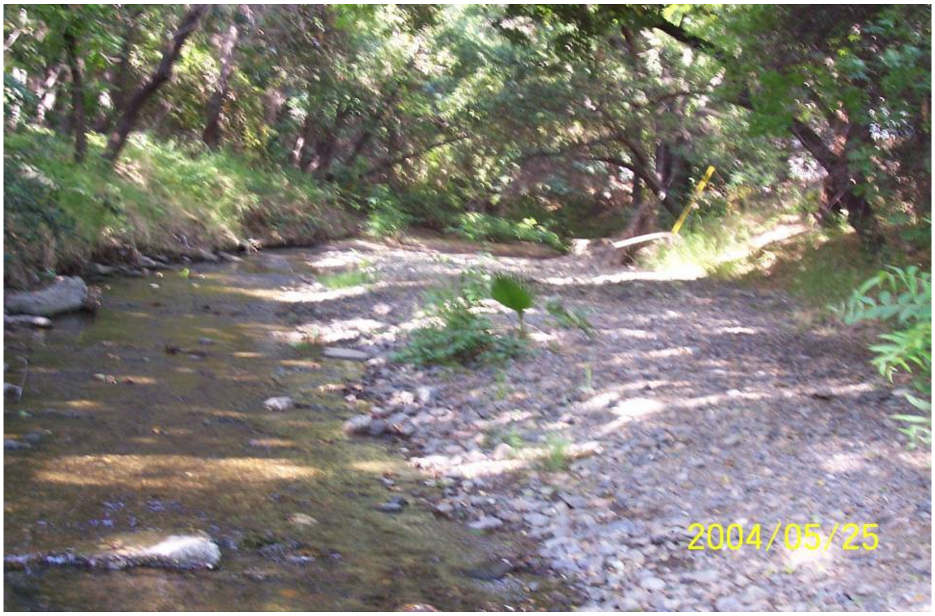


Looking Upstream from upstream of Rainbow Drive (STA 495+02)

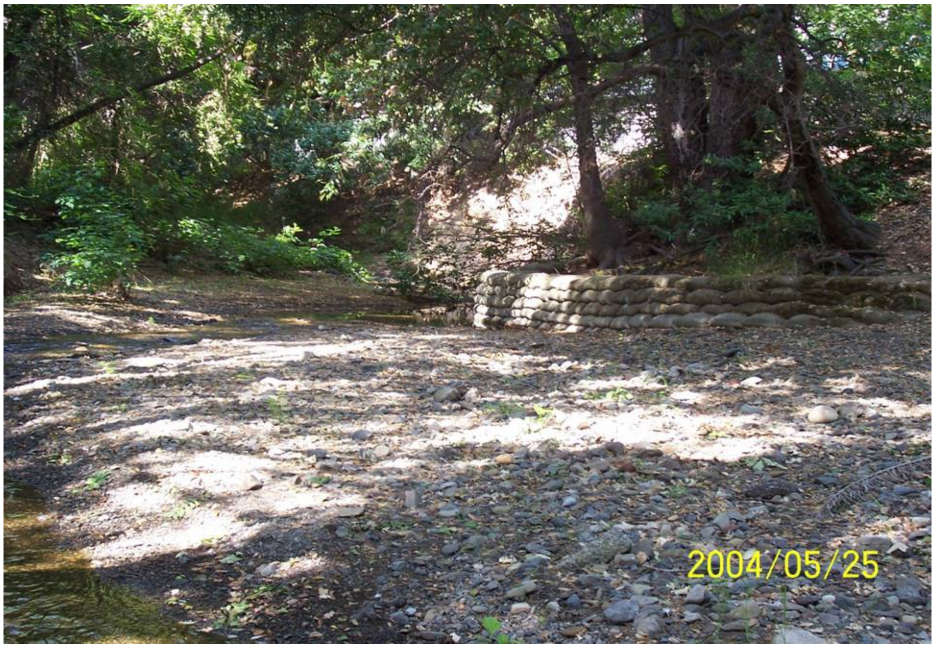
Channel Description:

A trapezoidal straight natural channel upstream of sack concrete which begins immediately upstream of the concrete wing wall. Channel is well vegetated with mature trees and some other grasses. Channel invert consists of sand and gravel covered with watercress right below the sack concrete.

CALABAZAS CREEK



Looking Upstream (STA 496+10)

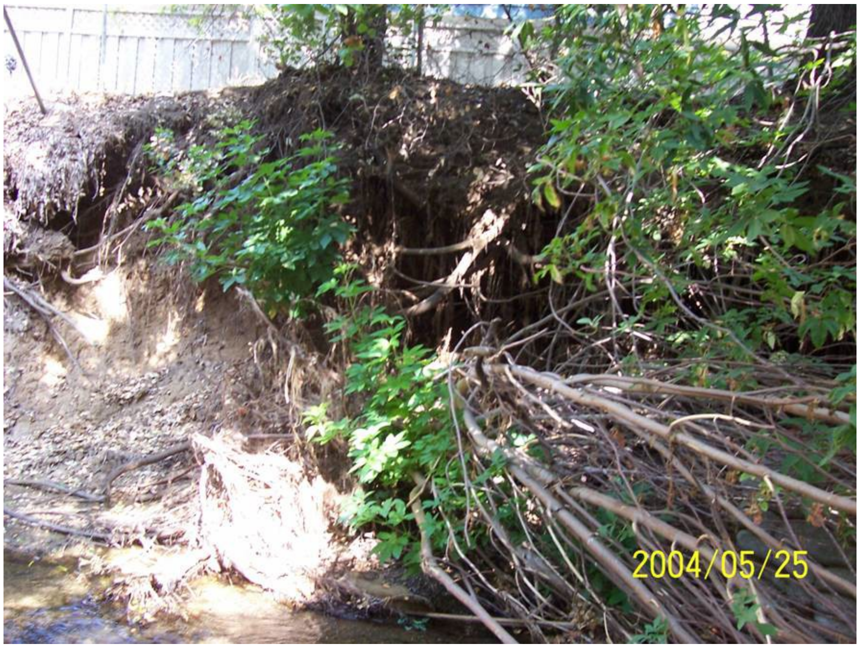


Looking Upstream (STA 496+76)

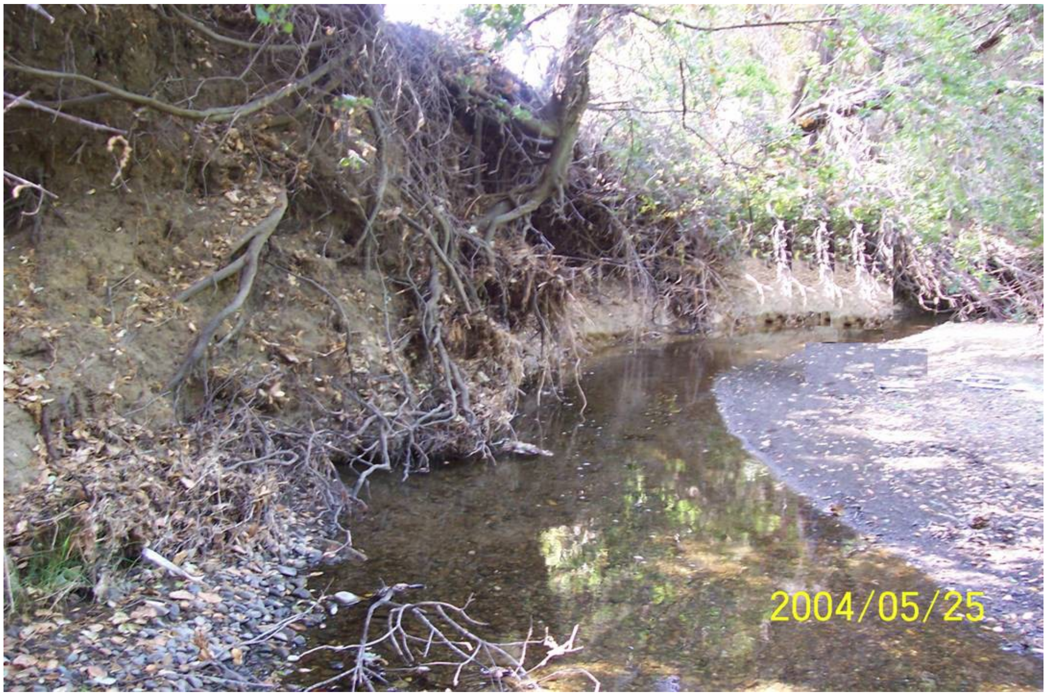
Channel Description:

The channel is a wide and shallow trapezoidal natural channel with straight and curved alignment. Channel invert consists of a significant sediment deposition. Bank slopes are firm soil covered with trees. Further upstream on the top of the right bank there is an approximately 4 feet masonry type wall.

CALABAZAS CREEK



(STA 497+02)

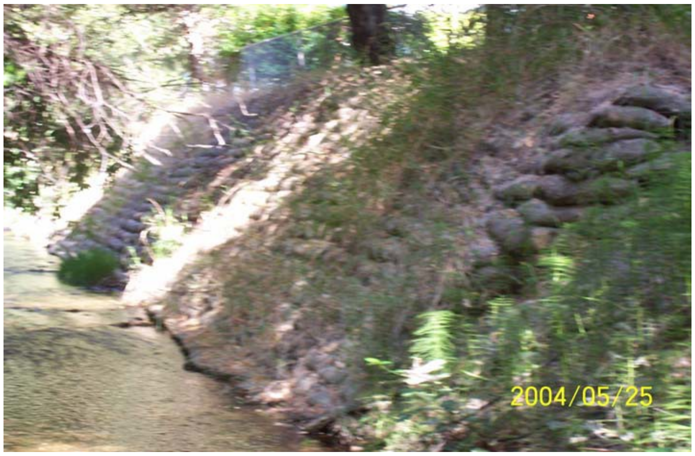


Looking Upstream (STA 497+87)

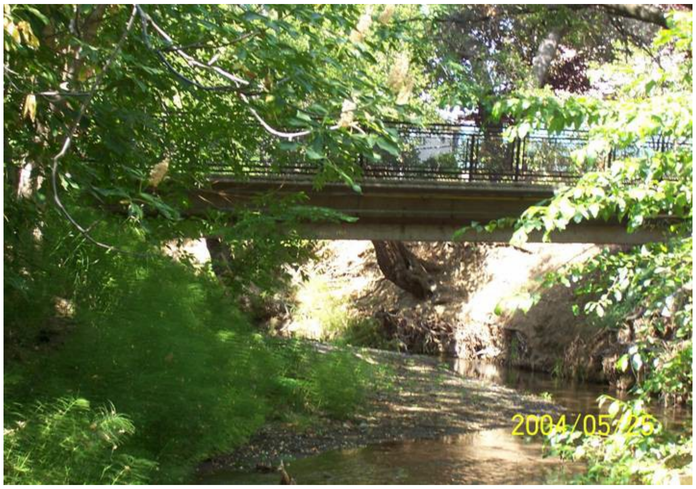
Channel Description:

A trapezoidal curved earth channel. Significant erosion on the left bank slope with some trees on the top of the bank. Channel invert material consists of sand and gravel

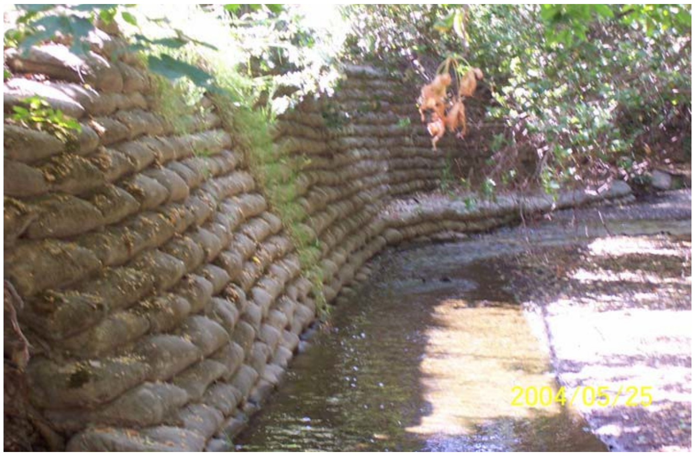
CALABAZAS CREEK



(STA 499+00)



(STA 500+13)



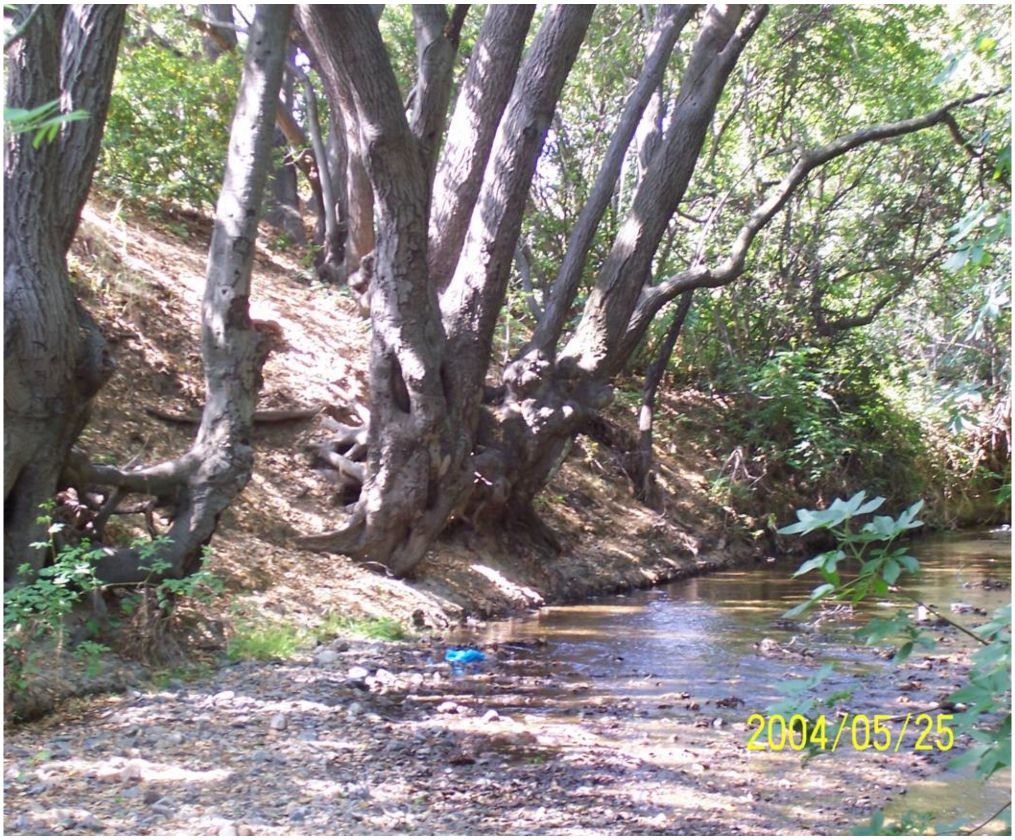
(STA 501+58)

Looking Upstream

Channel Description:

A trapezoidal earth channel with sack concrete on the east bank slope downstream of the walk bridge and also sack concrete on the left bank slope upstream of the pedestrian bridge. Channel bottom consists of sediment deposition covered with undergrowth grass in some area.

CALABAZAS CREEK



(STA 502+43)

Channel Description:

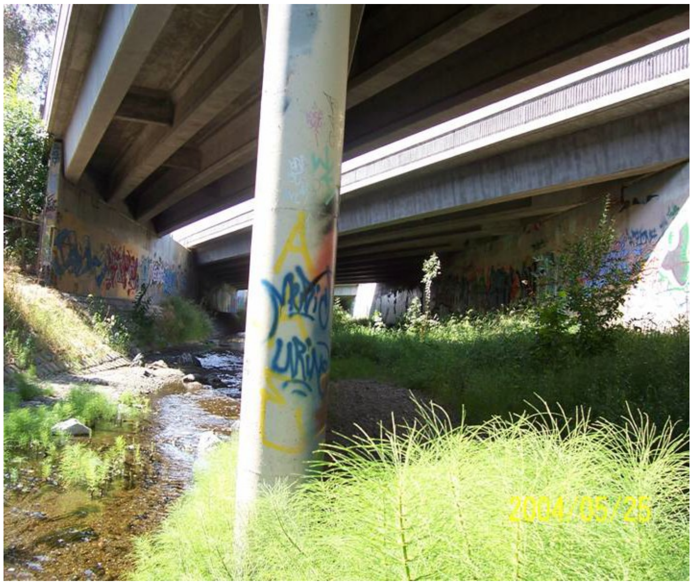
The channel is a trapezoidal natural channel with straight alignment. Relatively shallow banks with mature trees on the bank slopes. Channel invert material is sandy and gravel.

CALABAZAS CREEK

Looking Upstream, downstream of HWY 85 (STA 506+02)

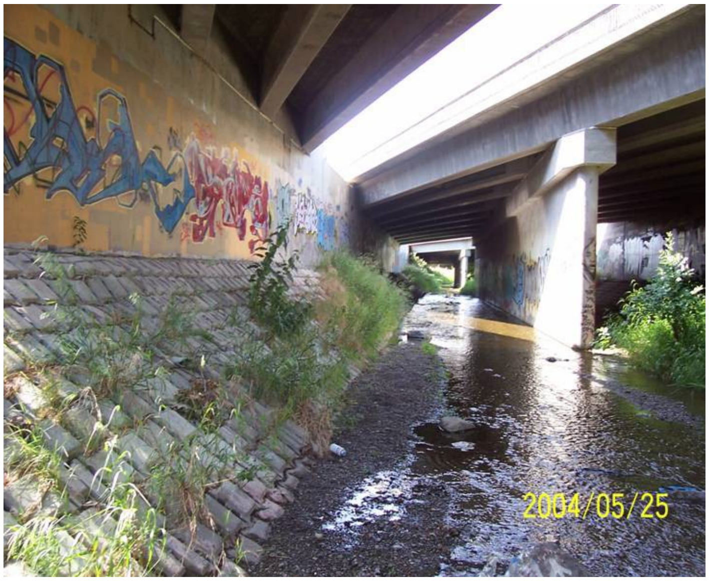
Looking Downstream from downstream of HWY 85 (STA 506+02)

CALABAZAS CREEK



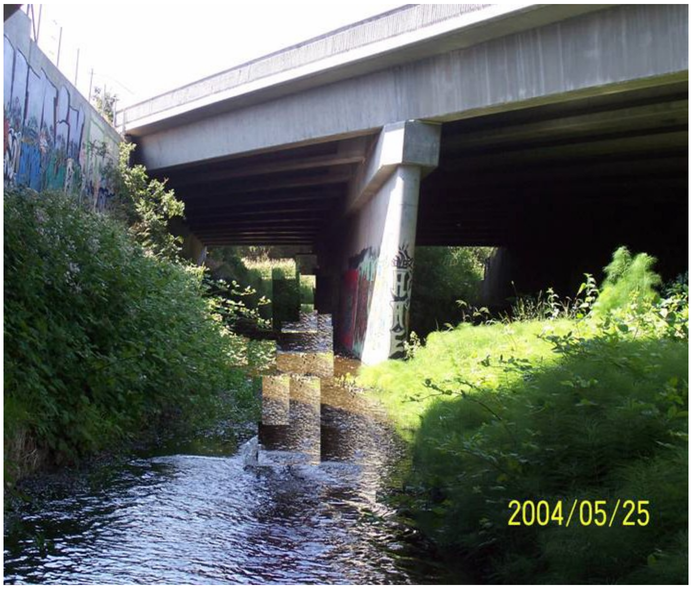
2004/05/25

king Upstream, downstream of HWY 85 (STA 506+41)



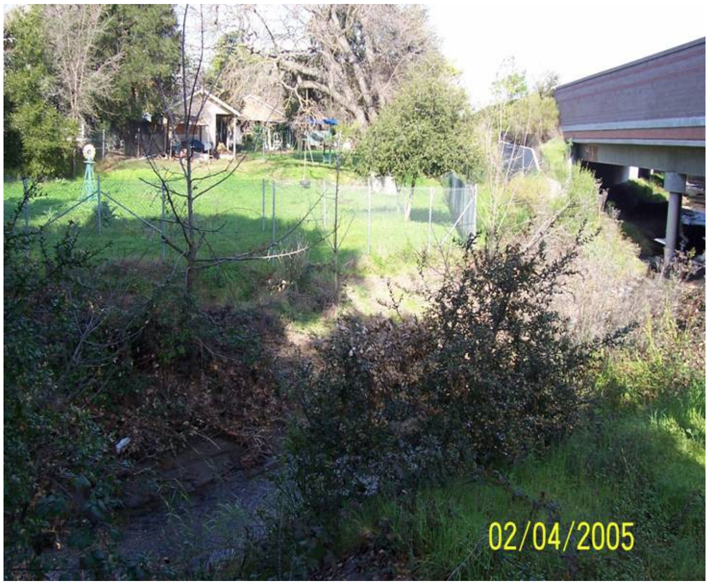
2004/05/25

Looking Upstream, under HWY 85, both bank slopes are articulated concrete blocks (STA 507+00) ±



2004/05/25

king Upstream, middle of HWY 85 (open space), (STA 509+75) ±



02/04/2005

Looking Downstream upstream of HWY 85 (STA 512+84)

REACH 30

Reach 30: Upstream of HWY 85 Bridge to upstream of Saratoga-Sunnyvale Road Culvert (Sta 511+92.8 to Sta 531+94.2)

Reach Description:
The trapezoidal earth channel is primarily straight with some meandering alignment. This reach consists of sections of natural banks with channel erosion work in spots. In some areas, sack concrete slope protection was used to stabilize the bank. Sacked concrete is mainly located downstream of the underground culvert stretching from Prospect Road to Saratoga-Sunnyvale Road. Channel invert material consists mainly of coarse and fine gravel and watercress downstream of Prospect Road. Upstream of HWY 85, the channel is heavily vegetated with mature trees and some blackberry bushes.

The Prospect Road to Saratoga-Sunnyvale Road culvert is a 660 feet long underground box culvert. The culvert is curved with 12 feet in width and 10-11.5 feet in dept. Pedestrian access to underground culvert is difficult, but possible from both the downstream end (Prospect Road) and upstream end (Saratoga-Sunnyvale Road).

The entire reach is within the Cities of San Jose and Saratoga. Distinctive features in this reach include a freeway drainage concrete U frame channel located upstream of HWY 85 looking upstream on the east bank conveying 50 cfs into the Calabazas Creek ,a vertical drop structure located at the sacked concrete area downstream of the culvert (Prospect Road) and a drop structure within the culvert itself.

Reach Right-of-Way: The District does not possess enough right of way at the location shown in the following table. Refer to Figure 9 for details.

Table 4: Insufficient right of way location within reach 30

Reach	Beginning Station	Ending Station	Length	Properties where District has insufficient ROW
30	525+50	531+80	630	1 commercial

Reach Average Invert Slope: Approximate average slope for this reach is 0.009 (from Sta 511+92.8 to Sta 524+11.2)

1% Flow:

1850 cfs - upstream Hwy 85 (Sta 511+92.8)
1800 cfs – upstream HWY 85 (Sta 512+59.2) to upstream Saratoga-Sunnyvale (Sta 531+94.2)

10% Flow:

920 cfs – upstream Hwy 85 (Sta 511+92.8)
880 cfs - upstream HWY 85 (Sta 512+59.2) to upstream Saratoga-Sunnyvale (Sta 531+94.2)

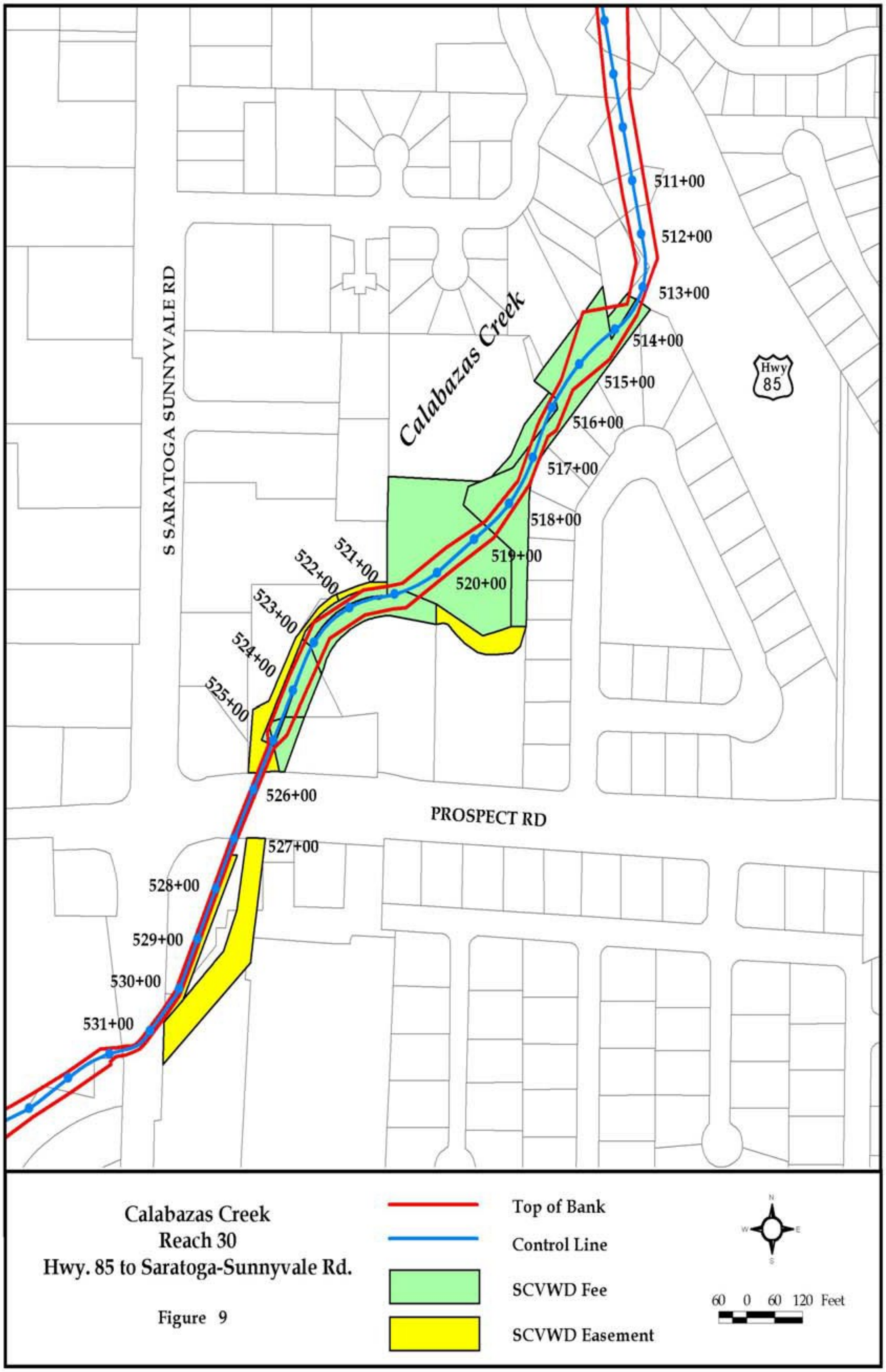
Current Reach Capacity: This reach has the capacity to convey 1% flow (1850 cfs-1800 cfs) from upstream of Saratoga-Sunnyvale to upstream of HWY 85.

Reach Flooding area Profiles: No flooding issues exist within this reach.

Reach Roughness Coefficient: For this report the roughness coefficient of .05 for natural channel, .044 for rock bed, and .036 for sack concrete was used. For areas with concrete material (bridges and wing walls and ect.) the roughness coefficient was .015.

Reach Typical Photos: See the following pages for typical photos and their channel descriptions. Pagination of photos is 30-1 to 30-9. For location and stationing see Figure 9.

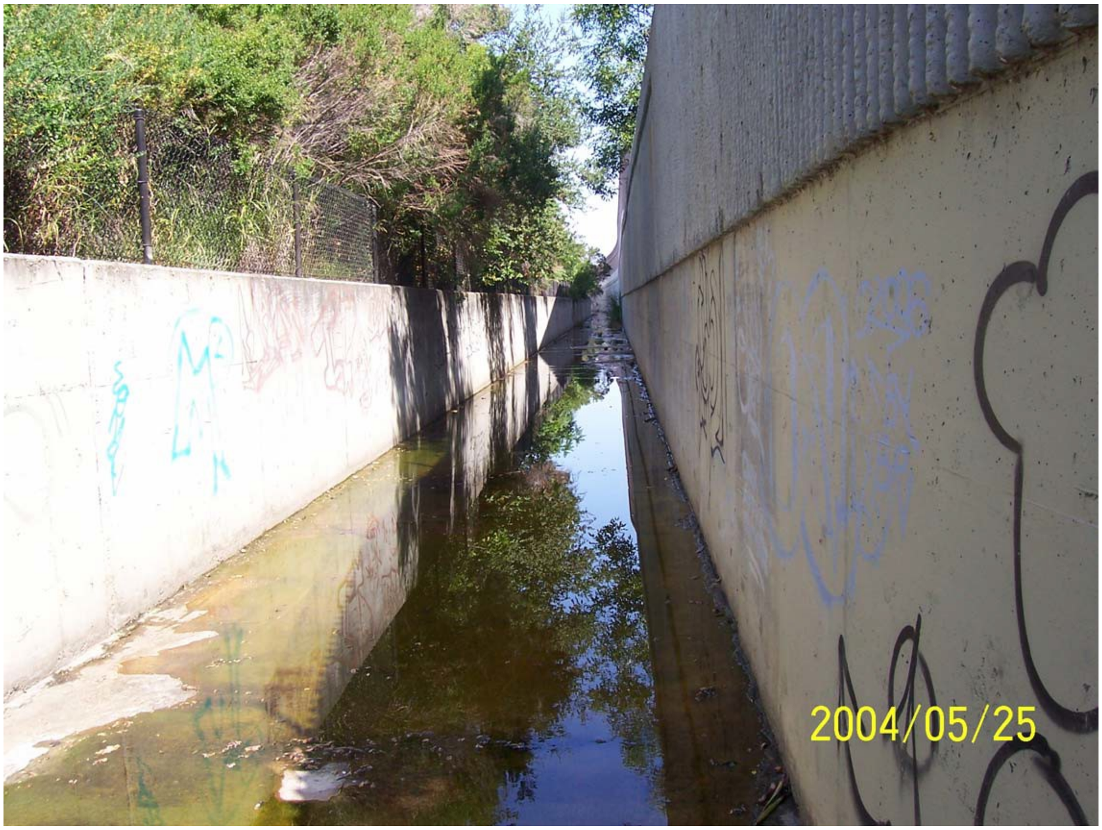
Reach Erosion Problem: Significant spot erosion occurs in this reach. See the following photos for the location and more details.



Calabazas Creek
Reach 30
Hwy. 85 to Saratoga-Sunnyvale Rd.

Figure 9

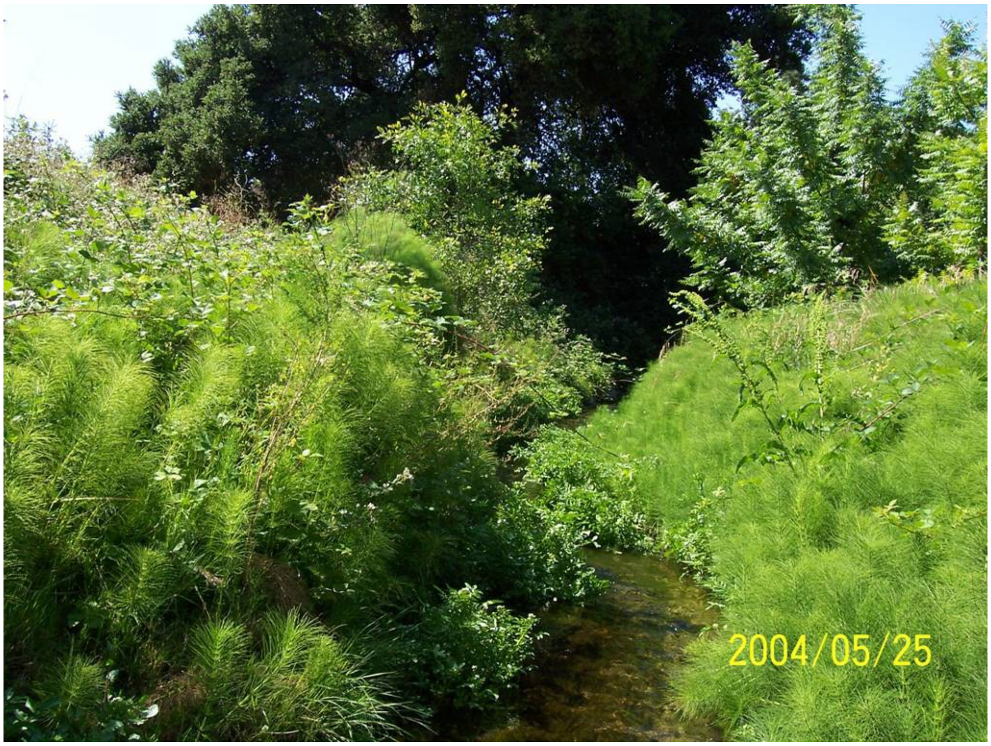
CALABAZAS CREEK



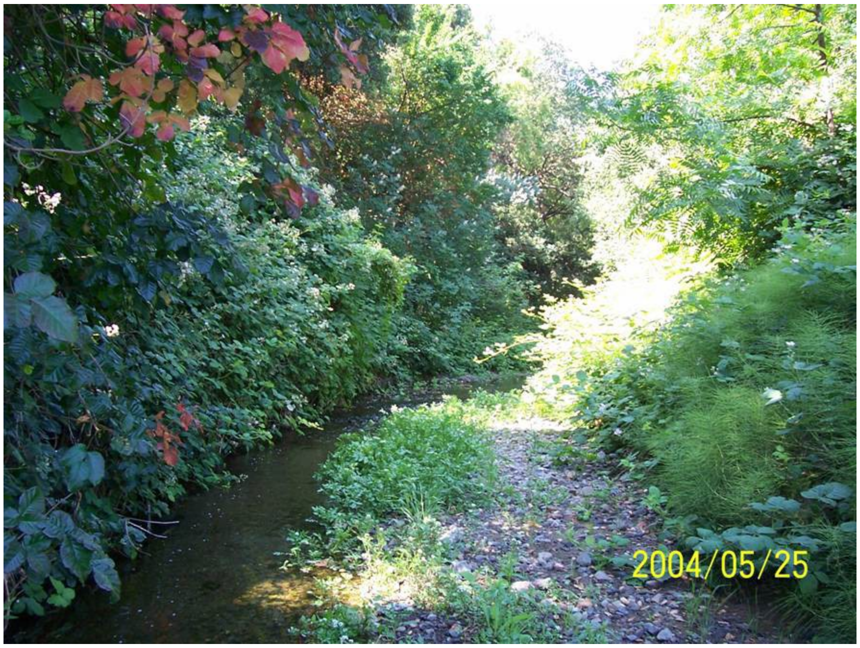
2004/05/25

Looking Upstream, right at upstream of HWY 85 right bank freeway drainage concrete U frame channel. This U frame channel that is parallel to HWY 85 was constructed during the construction of HWY 85 in 1992. This photo is taken from Calabazas Creek looking upstream of the U frame channel. HWY 85 drains into this U frame channel. (STA 512+00)

CALABAZAS CREEK



(STA 512+12)

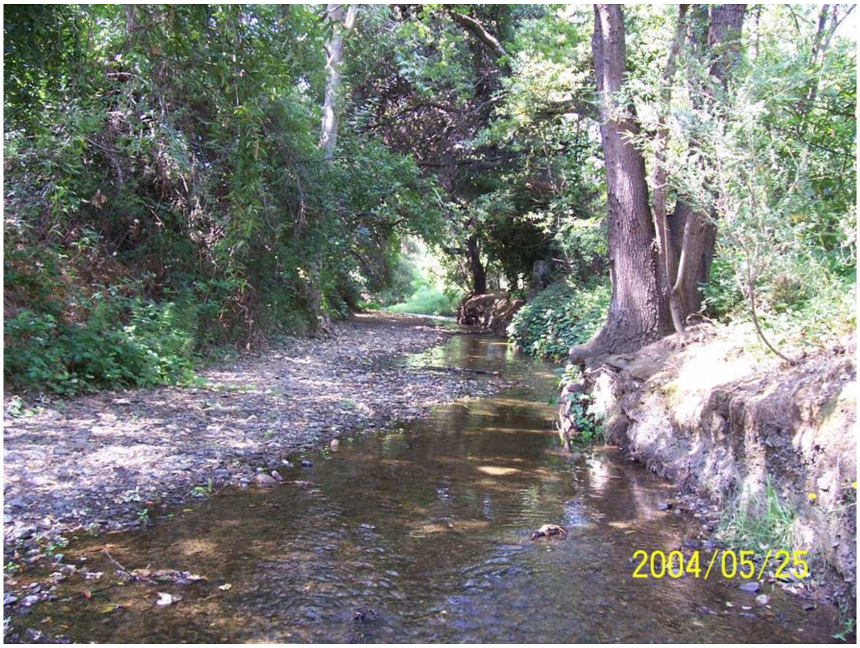


(STA 513+16)

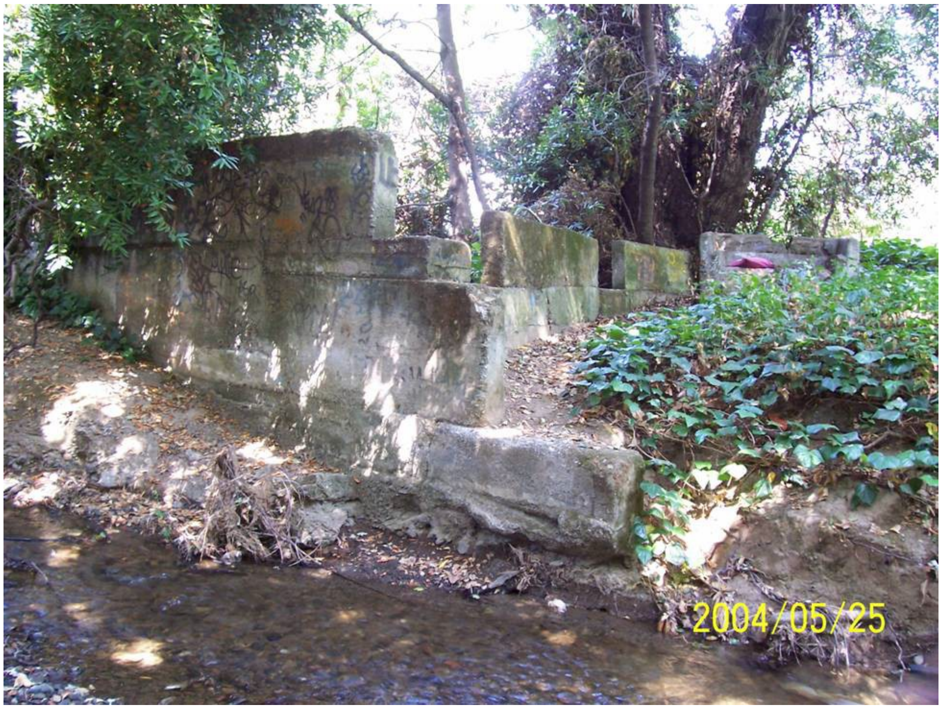
Channel Description:

The channel is a natural earth with straight to some meandering alignment. Part of channel invert and both bank slopes are fully vegetated with blackberry bushes and some other vegetation. Further upstream invert consists of some sediment deposition.

CALABAZAS CREEK


2004/05/25

Looking Upstream (STA 514+74)

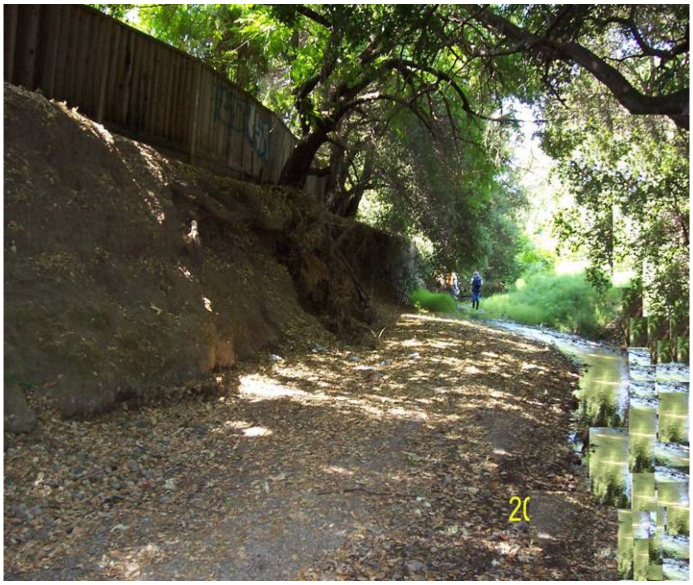

2004/05/25

Looking Upstream (STA 516+40)

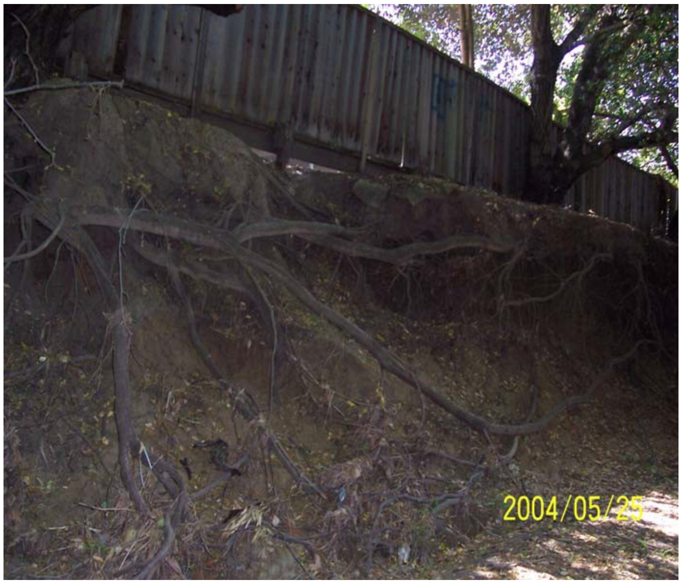
Channel Description:

A trapezoidal earth channel with straight alignment and a wide channel invert and relatively shallow right bank slope. Invert material is sand and some cobble. Further upstream there is a concrete wall that looks like an old bridge abutment, behind this structure there is an old well-storage tank. Channel is vegetated with some trees and some bushes.

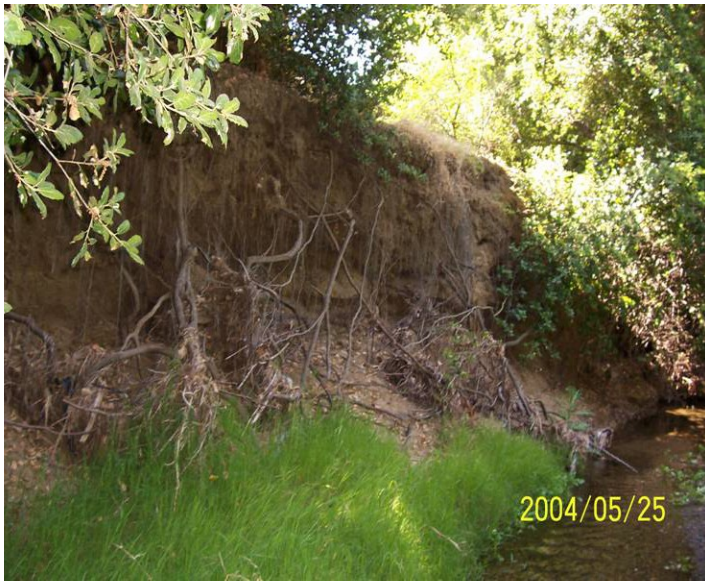
CALABAZAS CREEK



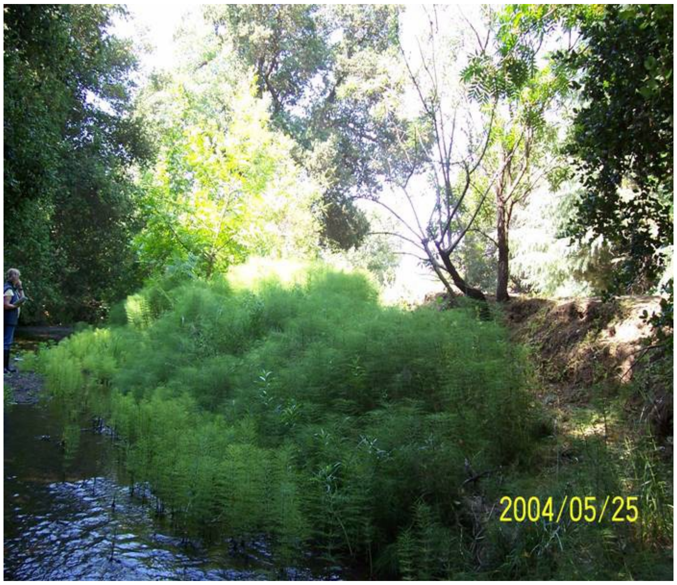
oking Upstream left bank (STA 516+87)



Looking Upstream left bank (STA 517+28)



oking Upstream left bank (STA 517+49)

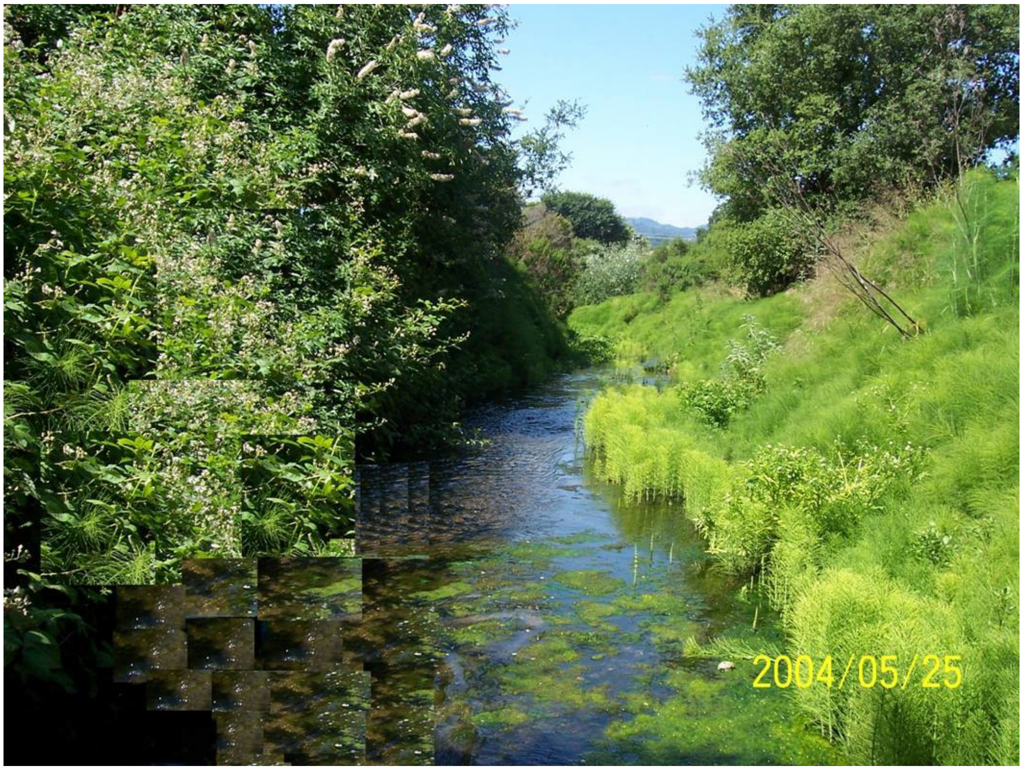


Looking Upstream right bank with a maintenance ramp (STA 517+49)

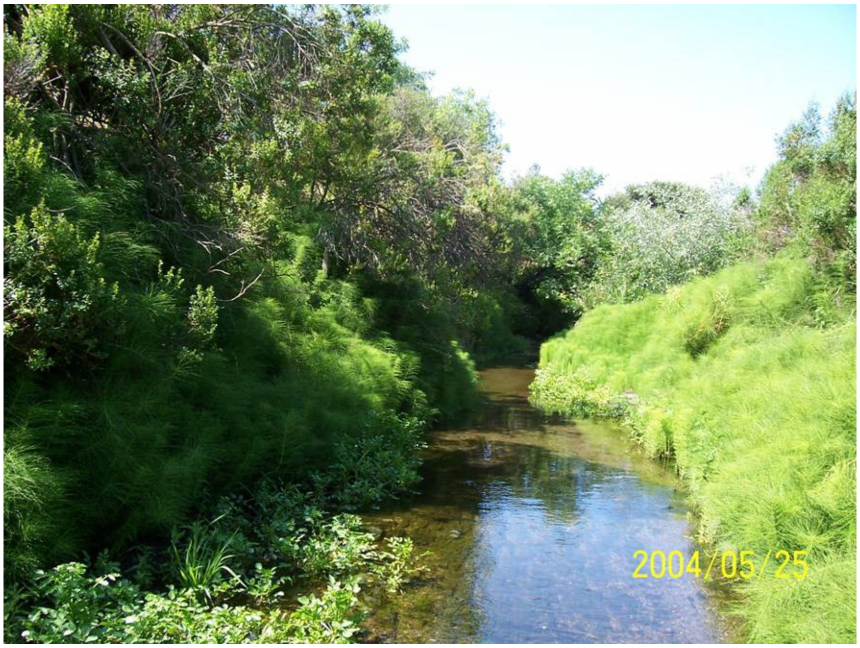
Channel Description:

The channel is a trapezoidal earth with straight alignment and some meandering at the end. The channel has relatively wide bottom width covered with a significant sediment deposition and heavily eroded bank slopes. A few trees located on top of the banks. Further upstream invert gets wider and partially covered with some undergrowth vegetation and more mature trees on the top and bank slopes.

CALABAZAS CREEK



Looking Upstream (STA 517+78)

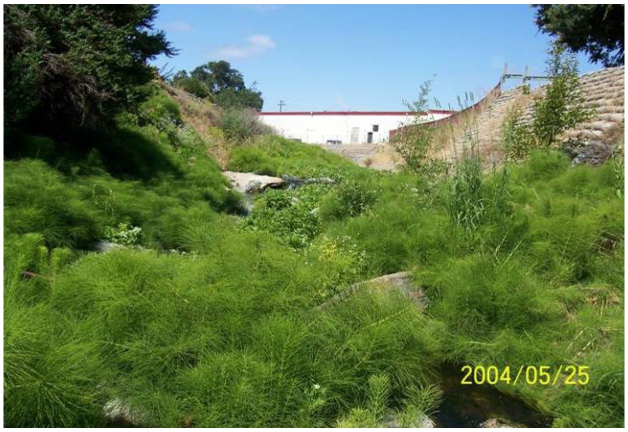


Looking Upstream (STA 519+14)

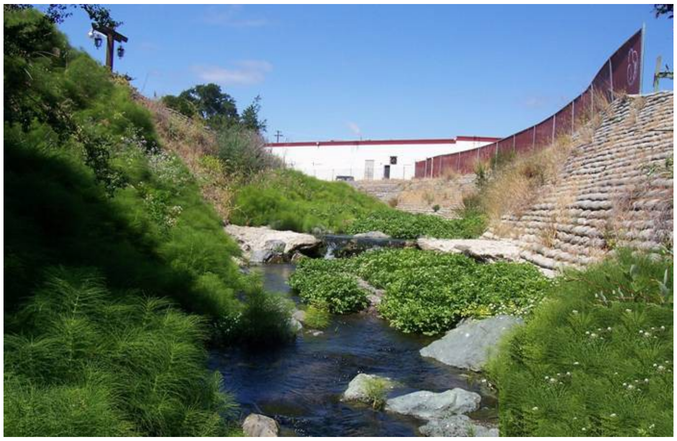
Channel Description:

A wetland area with a trapezoidal natural earth channel mostly straight alignment. Channel is heavily vegetated with mature trees on the left bank and with undergrowth of grass on the right bank.

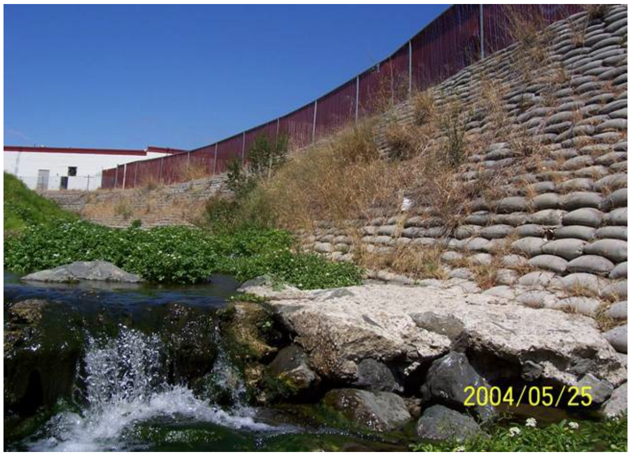
CALABAZAS CREEK



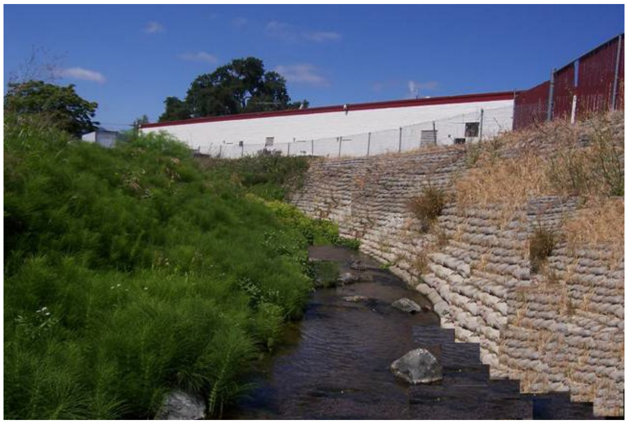
Looking Upstream wetland area (STA 520+28)



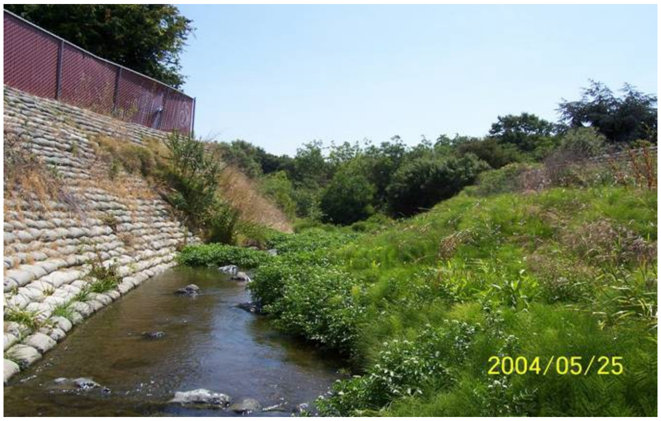
Looking Upstream wetland area (STA 520+67)



Drop Structure (STA 521+43)



oking Upstream wetland area right bank (STA 522+32)

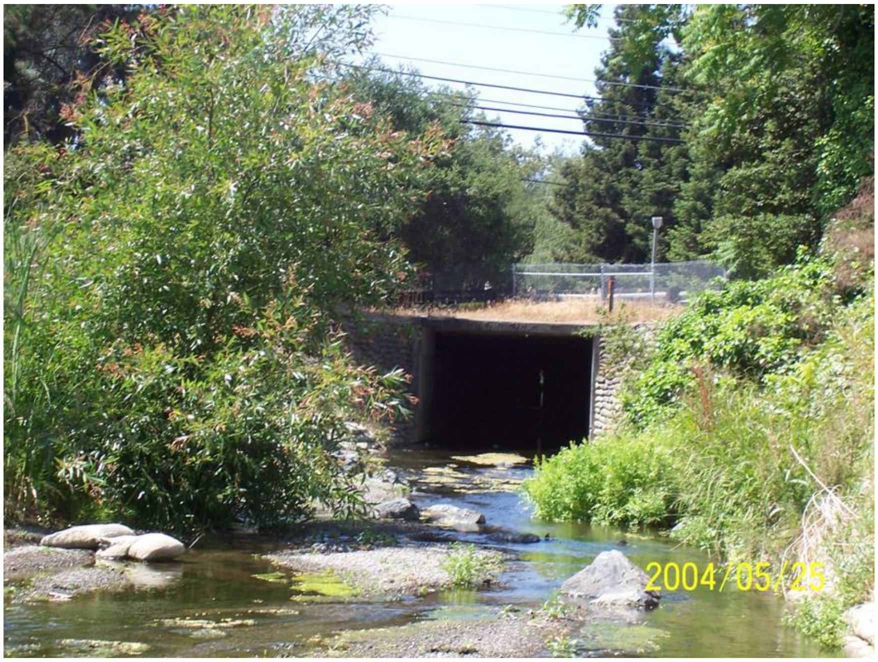


Looking Downstream wetland area left bank (STA 522+32) ±

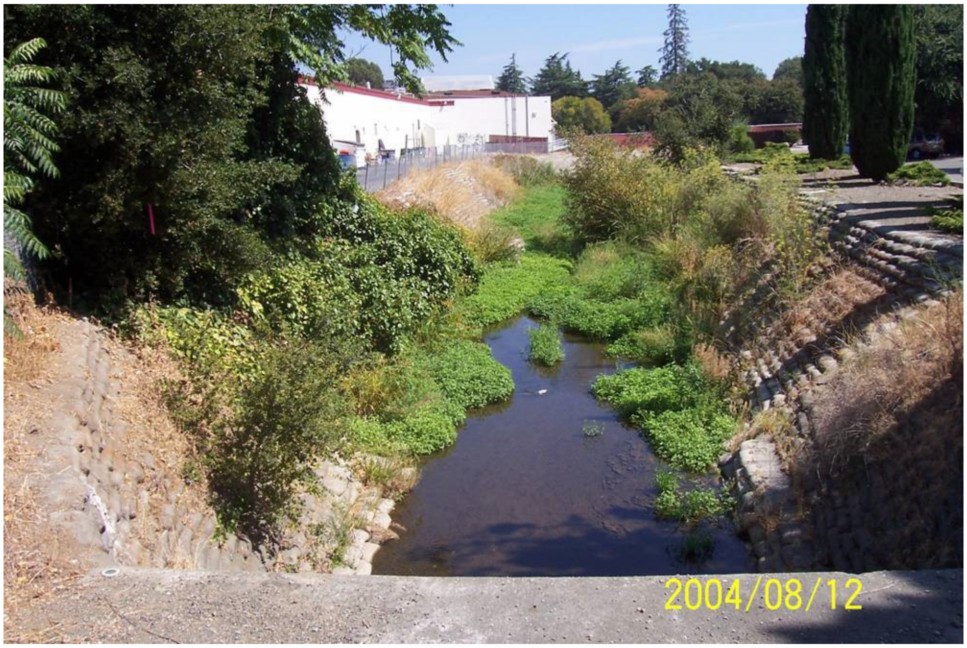
Channel Description:

The channel is a trapezoidal with straight to some sinuous alignment. Channel invert is covered with watercress and some rocks. The presence of watercress make this a wetland area. Both bank slopes are sack concrete. One drop structure located right at the beginning of left bank sack concrete (looking upstream).

CALABAZAS CREEK

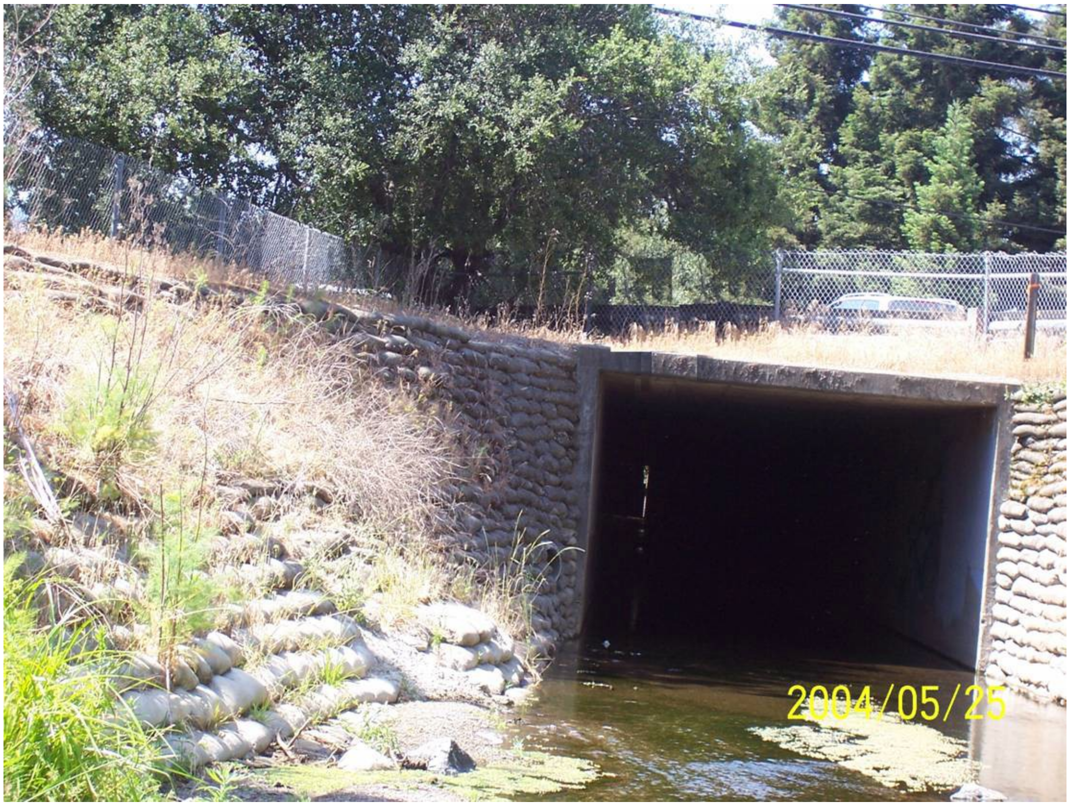

2004/05/25

Looking Upstream, downstream of Prospect Culvert (Saratoga-Sunnyvale Culvert), (STA 524+20)


2004/08/12

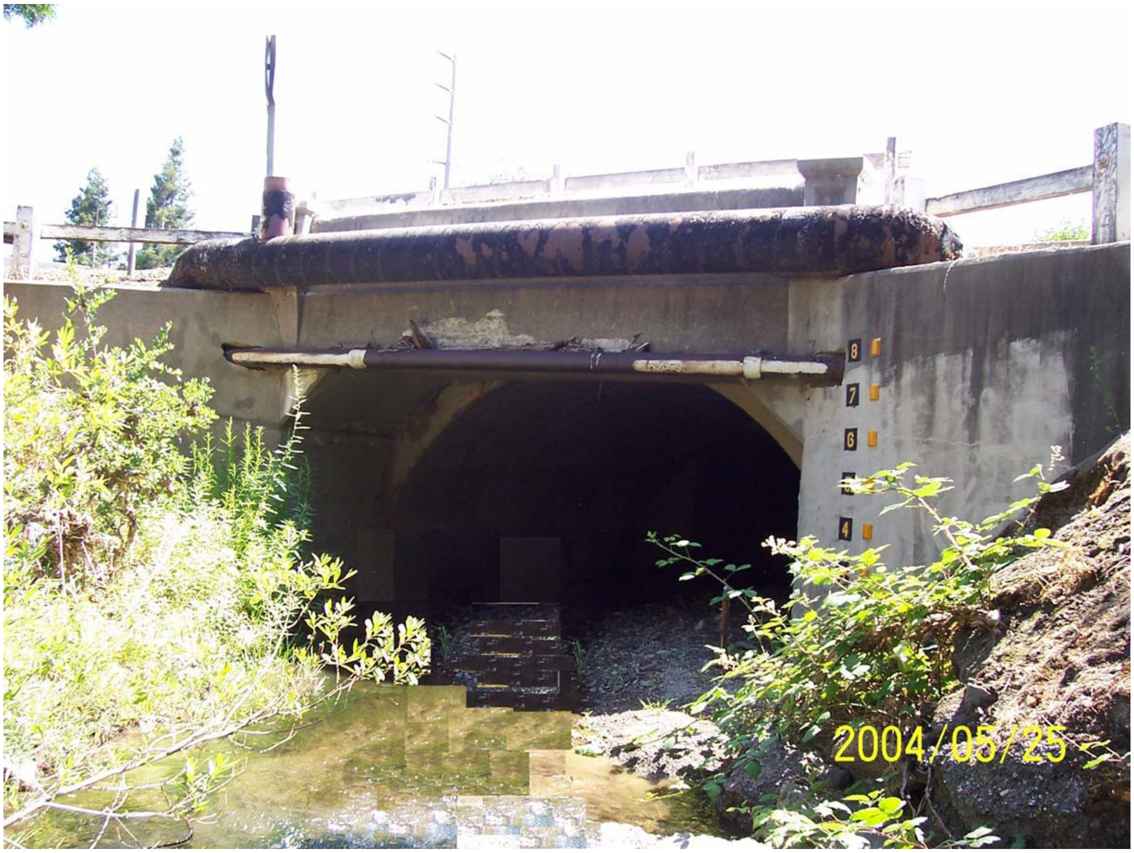
Looking Downstream from downstream of Prospect Culvert (Saratoga-Sunnyvale Culvert), (STA 525+17)

CALABAZAS CREEK



Looking Upstream, downstream of Prospect Culvert (Saratoga-Sunnyvale Culvert), approximately 660 feet long with curved alignment and one outfall inside the culvert with sack concrete wing walls (STA 524+80)

CALABAZAS CREEK



Looking Downstream, upstream of Saratoga-Sunnyvale Culvert, approximately 660 feet long with curved alignment and one outfall inside the culvert with concrete wing walls (STA 532+45)

REACH 31

Reach 31: Upstream of Saratoga-Sunnyvale Road Culvert to upstream of Union Pacific Railroad (UPRR) Culvert (Sta 531+94.2 to Sta 548+63)

Reach Description:
This reach is a trapezoidal earth with straight to some meandering alignment. Upstream of Saratoga-Sunnyvale culvert is relatively narrow channel with shallow top of banks with some erosion on the east bank. Further upstream east bank is covered with sacked concrete and west bank with some rocks and some broken concrete slabs. In some areas, there are erosion problems on the left bank slope with bare soil material. Invert material is mostly coarse gravel and fine gravel.

The UPRR Culvert is a 38 feet long single box culvert which varies in width. The width at the upstream face is about 14.5 feet and width at the downstream face is about 11.5 feet.

The entire reach is within the City of Saratoga. Distinctive features in this reach include the UPRR and Prospect Creek, which carries 600 cfs of flow into Calabazas Creek downstream of the UPRR. A large swale approximately 1350 feet long and 65 feet in width runs parallel to Calabazas Creek from Saratoga-Sunnyvale Road to downstream of the UPRR on the east side of the creek. Other features are a concrete vertical wall on the east bank at downstream side of UPRR culvert and two outfalls (36" and 48" diameter) on the west bank across from vertical wall. The downstream face of the UPRR culvert has a wooden head wall.

Reach Right-of-Way: The District does not possess enough right of way at the locations shown in the following table. Refer to Figure 10 for details.

Table 5: Insufficient right of way locations within reach 31

Reach	Beginning Station	Ending Station	Length	Properties where District has insufficient ROW
31	541+95	544+10	215	1 commercial
	544+80	546+40	160	1 residential

Reach Average Invert Slope: Approximate average slope for this reach is 0.011 (from Sta 531+94.2 to Sta 548+28)

1% Flow:

1800 cfs-Saratoga–Sunnyvale Road(Sta 531+94.2) to Prospect Creek (Sta 546+40.5)
1200 cfs–Prospect Creek (Sta 546+93.7) to UPRR (Sta 548+63)

10% Flow:

880 cfs–Saratoga–Sunnyvale Road (Sta 531+94.2) to Prospect Creek (Sta 546+40.5)
580 cfs Prospect Creek (Sta 546+93.7) to UPRR (Sta 548+63)

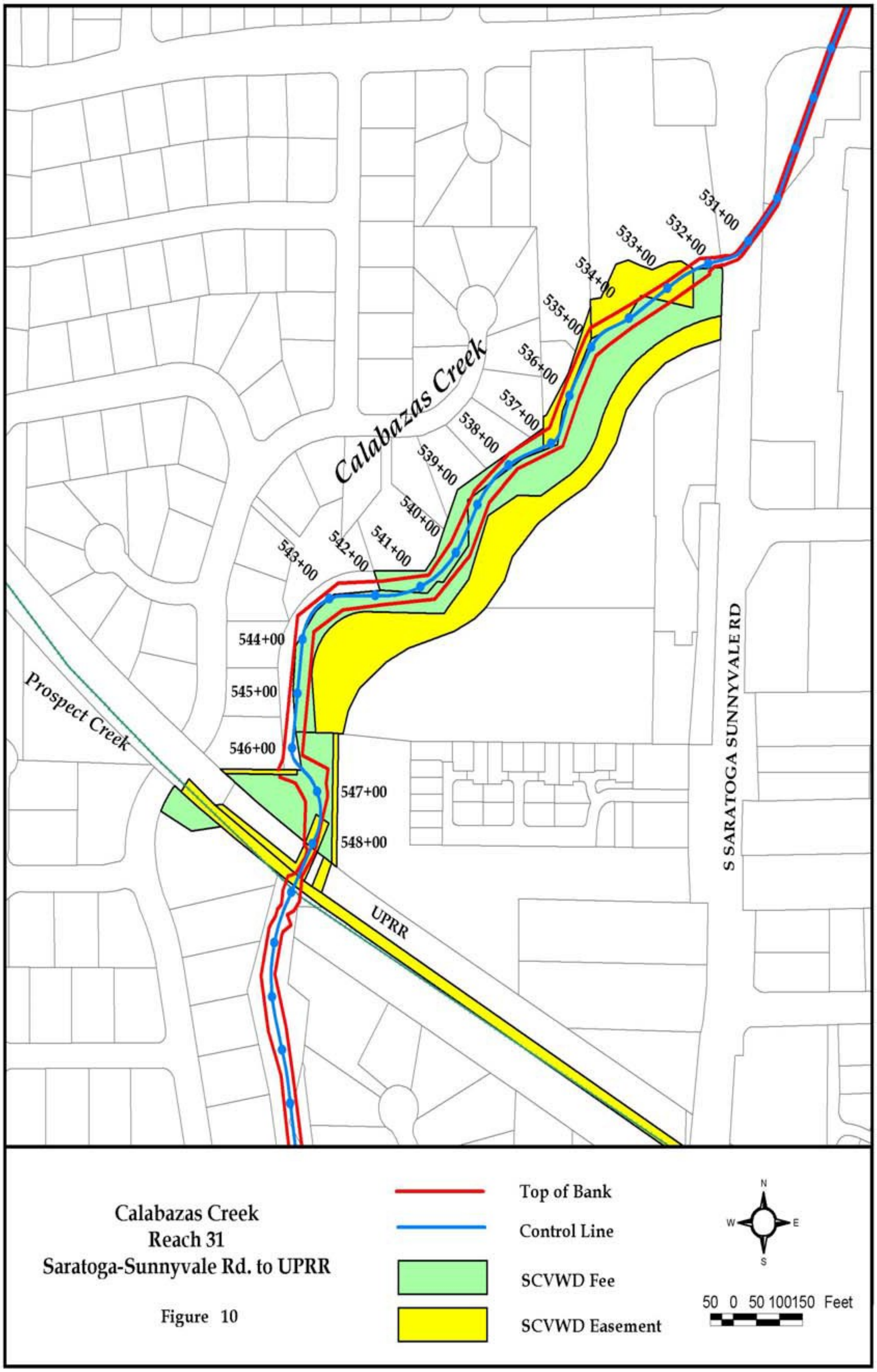
Current Reach Capacity: Between Sta 546+17.7 and Sta 547+14.6 the channel current capacity is 375 cfs. The range of water surface elevation above the top of the bank for this area is between 0.7'– 5.2'. Also between Sta 531+94.2 and Sta 538+82.8 the channel current capacity is 1048 cfs. The range of water surface elevation above the top of the bank for this area is between 0.4' – 3.4'. Rest of the reach has the capacity to convey 1% flow (1800 cfs-1200 cfs) from downstream of UPRR to upstream of Saratoga-Sunnyvale Road.

Reach Flooding area Profiles: See Appendix A, Hydraulic Report (Floodwater Break Points map and Profile 3 and 4 for flooding area).

Reach Roughness Coefficient: For this report the roughness coefficient of .05 for natural channel, .044 for rock bed, and .036 for sack concrete was used. For areas with concrete material (bridges and wing walls and ect.) the roughness coefficient was .015.

Reach Typical Photos: See the following pages for typical photos and their channel descriptions. Pagination of photos is 31-1 to 31-11. For location and stationing see Figure 10.

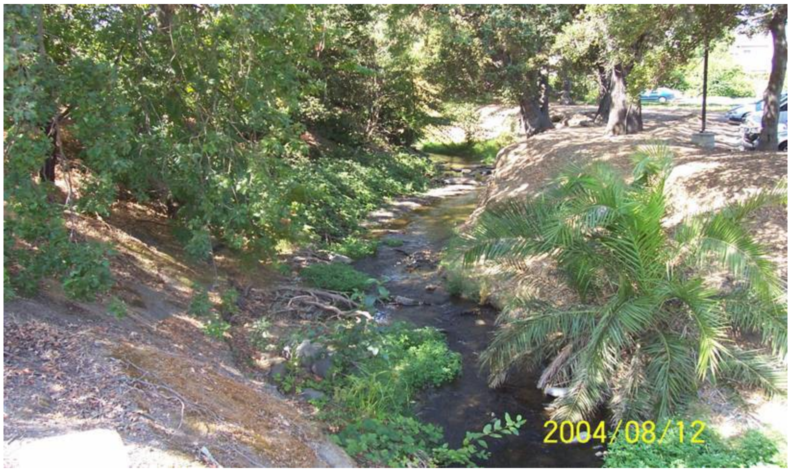
Reach Erosion Problem: Several erosion sites were found in this reach. See the following photos for the location and more details.



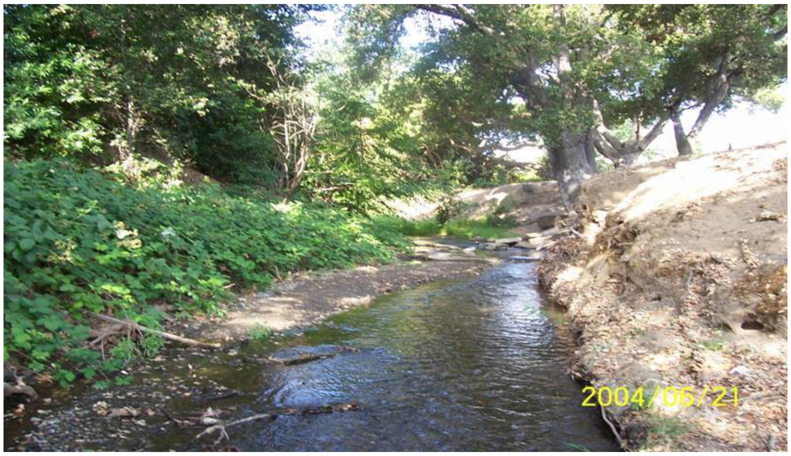
Calabazas Creek
Reach 31
Saratoga-Sunnyvale Rd. to UPRR

Figure 10

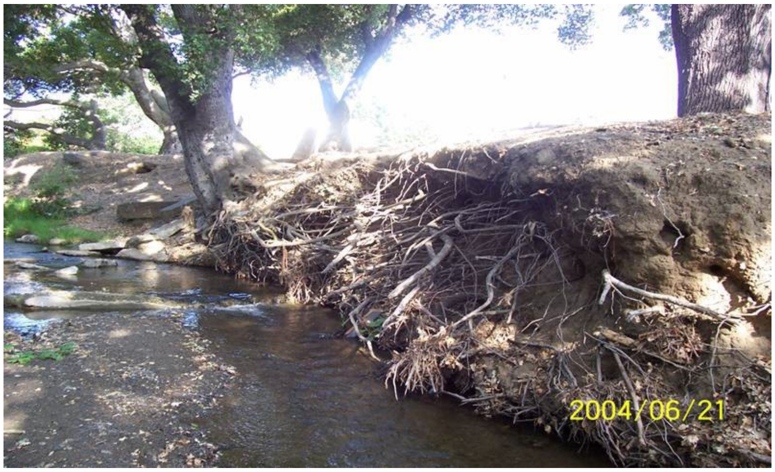
CALABAZAS CREEK



(STA 532+00)



(STA 532+50) ±

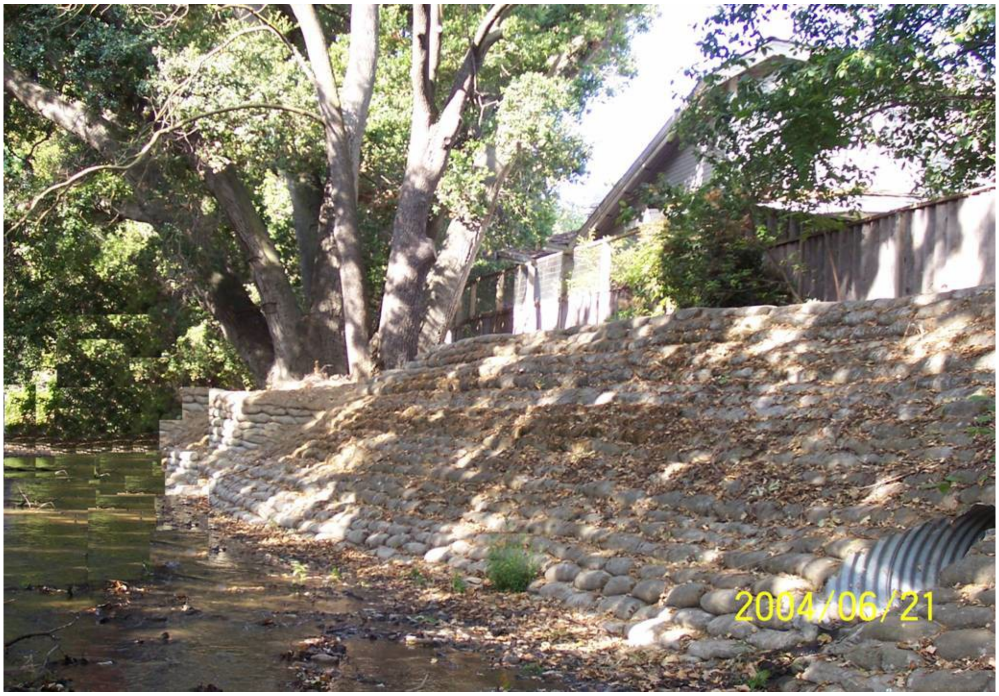


(STA 532+77)

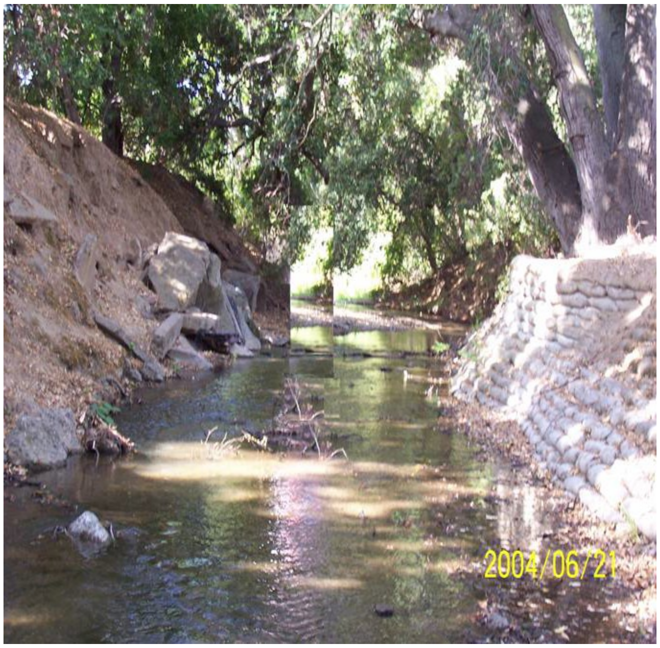
Channel Description: Looking Upstream

The channel is a trapezoidal earth with some meandering alignment. Channel invert is relatively narrow and consists of sand, gravel and some concrete pieces. Both bank slopes covered with bare soil and a few trees on top of the banks at downstream end. Further upstream eroded right bank covered with bare soil and left bank with some undergrowth of grass. From upstream of Saratoga-Sunnyvale culvert to downstream of UPRR (upstream of Prospect Creek) there is a swale located on the left side (looking upstream) of the creek.

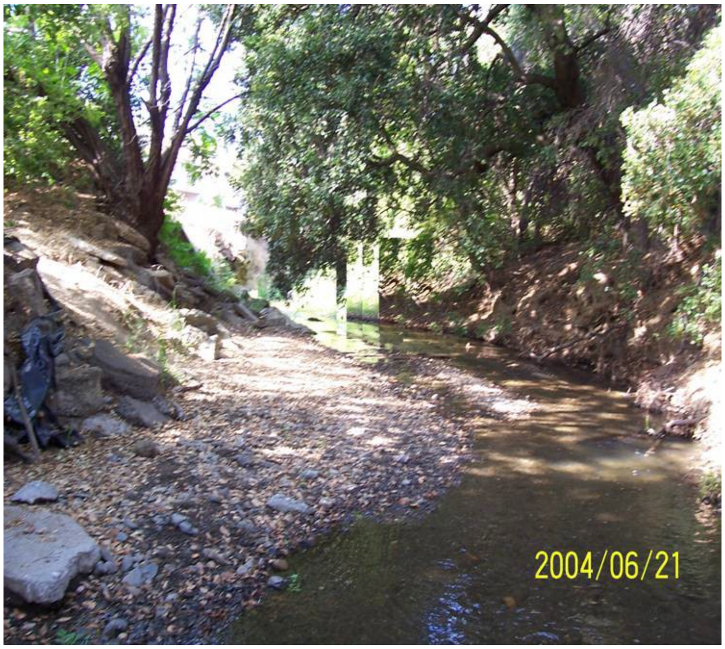
CALABAZAS CREEK


2004/06/21

(STA 534+70)


2004/06/21

A 535+36) ±


2004/06/21

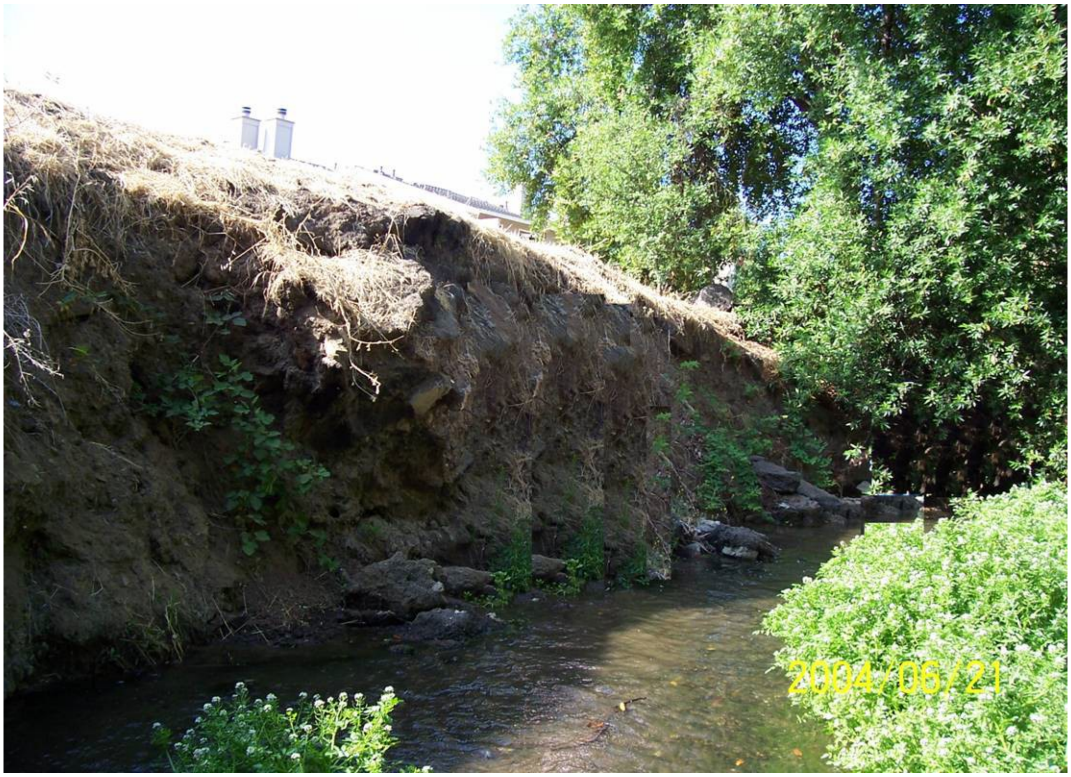
(STA 536+20) ±

Looking Upstream

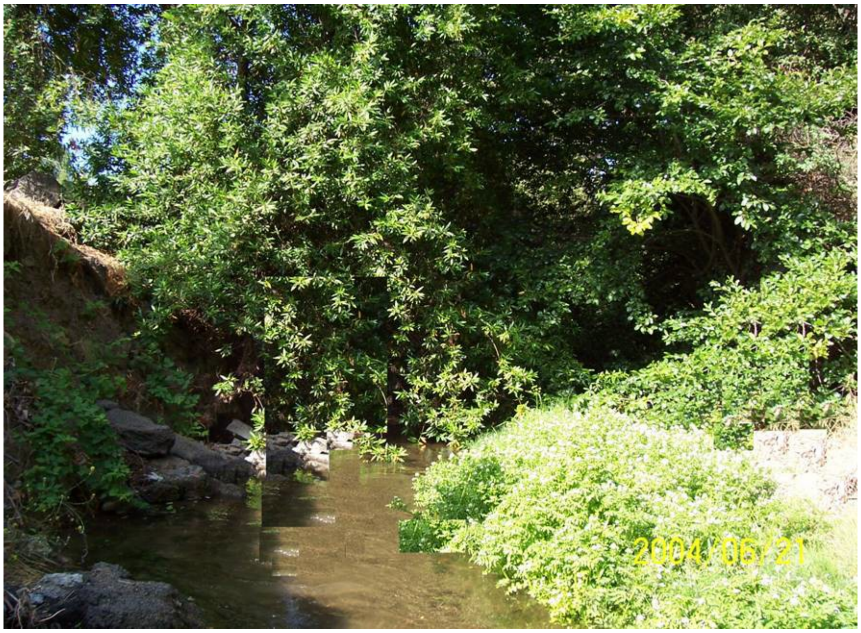
annel Description:

e trapezoidal-shaped channel is primarily straight and consists of sections of natural banks covered with bare il and some rocks and concrete pieces on the left side and sack concrete on the right side of the channel. Both nks have scattered mature trees. Invert material consists of sediment deposition in some area.

CALABAZAS CREEK



(STA 536+66)



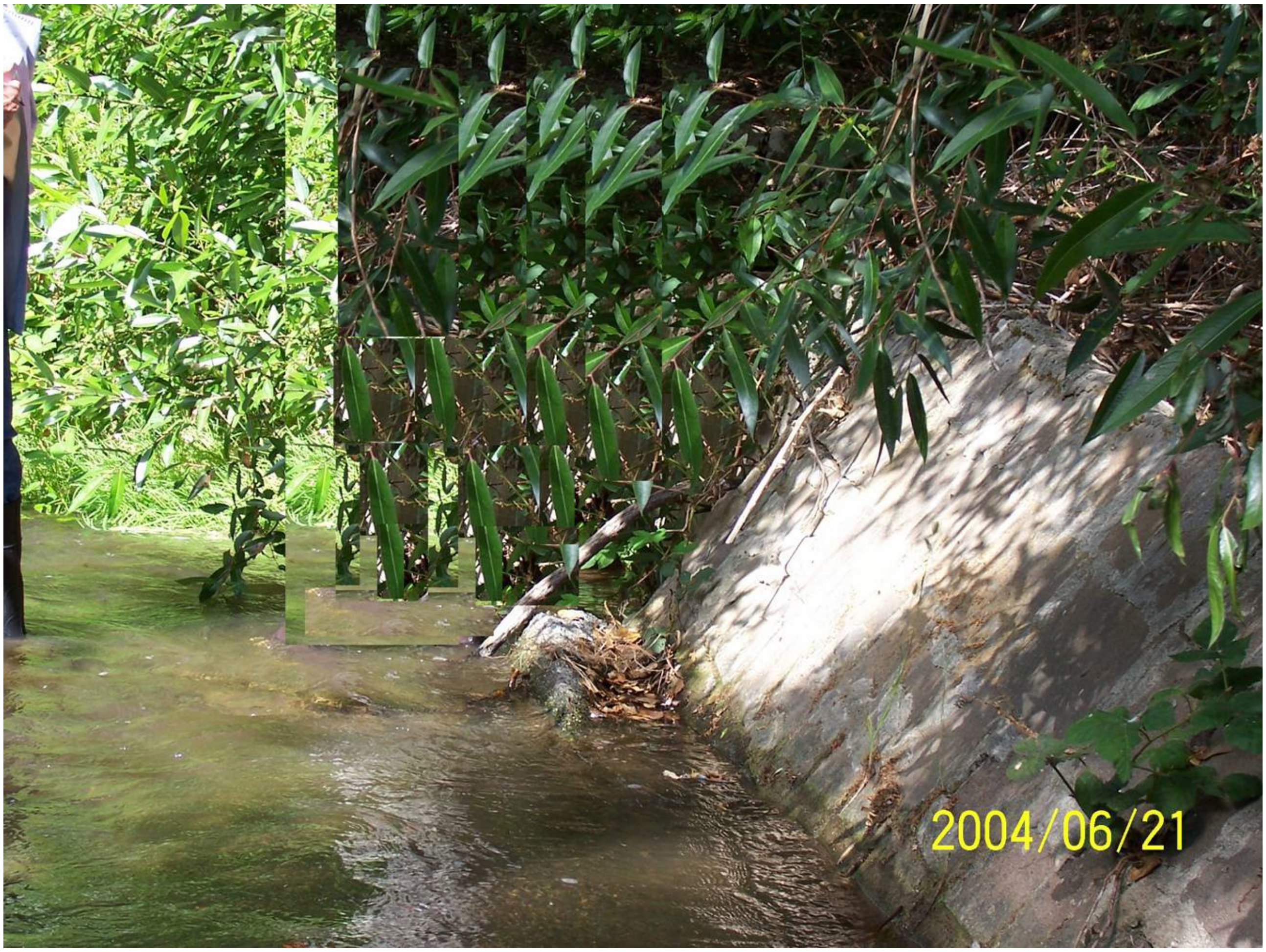
(STA 536+73)

Looking Upstream

Channel Description:

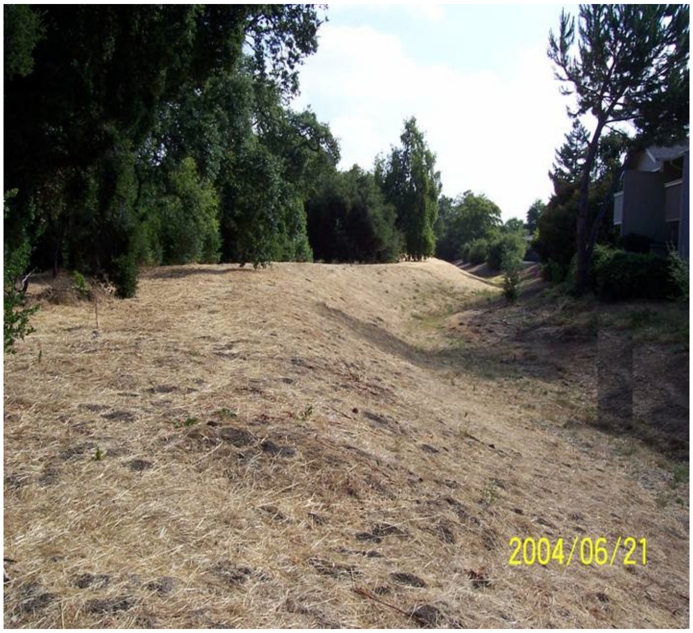
An earth channel with a sharp curve. Erosion on the left bank slope with bare soil material. Channel invert is covered with watercress in some area. Further upstream the channel is fully vegetated with mature trees.

CALABAZAS CREEK

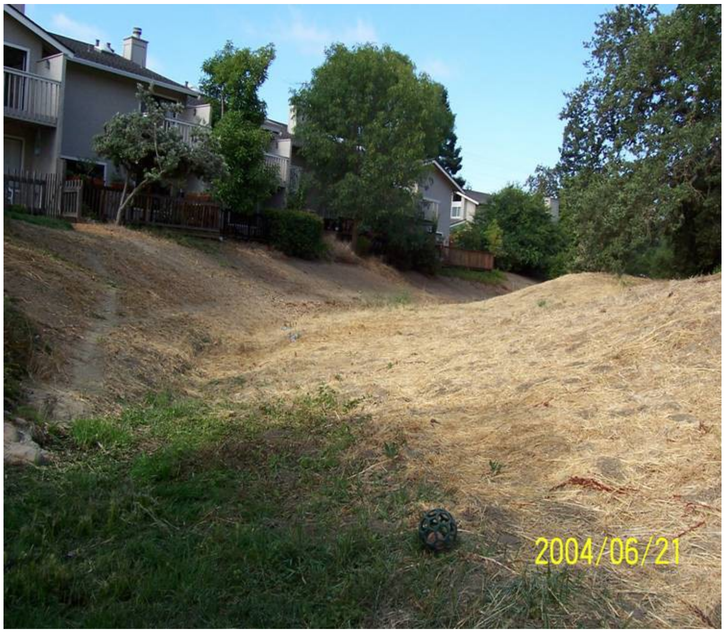


Looking Upstream, left bank slope concrete retaining wall. (STA 538+38)

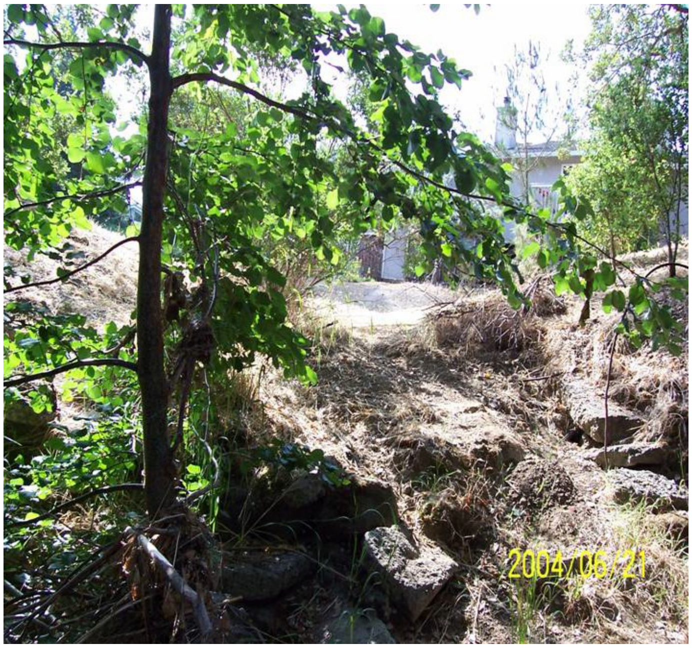
CALABAZAS CREEK



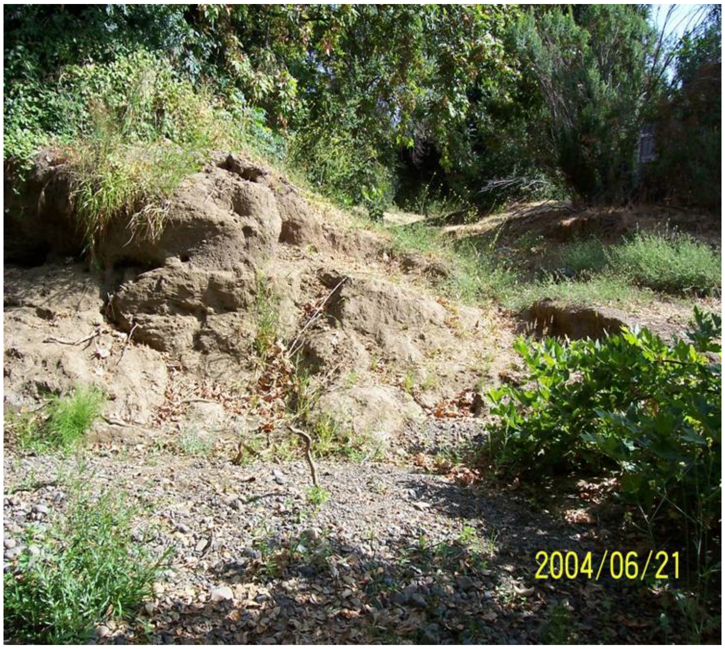
oking Downstream from swale adjacent to the Calabazas Creek
ated on the left side (STA 539+33)



Looking Upstream from swale adjacent to the Calabazas Creek located on the right side (STA 539+46)

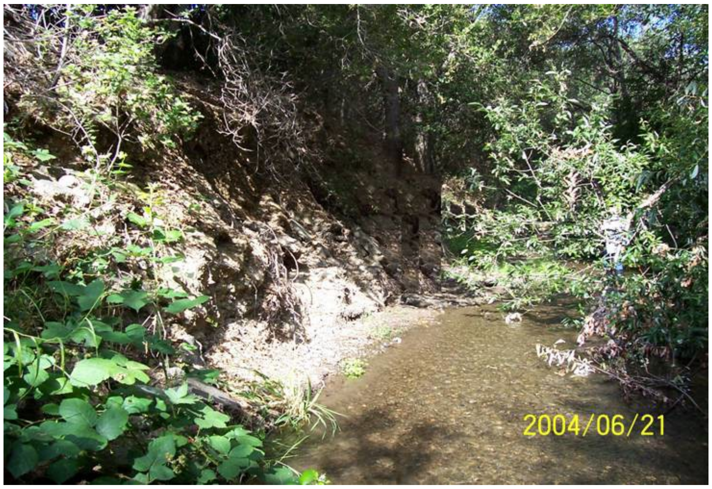


oking Upstream, left bank overflow from the swale (STA 540+46)

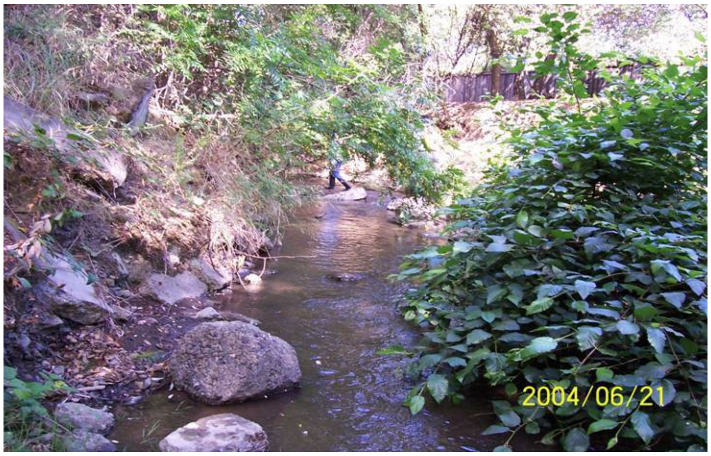


Looking Upstream, Left bank end of swale at Calabazas Creek across from Prospect Creek (STA 546+56) ±

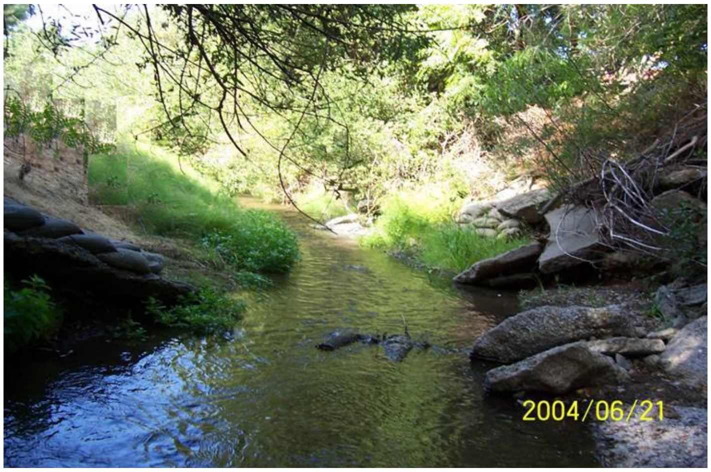
CALABAZAS CREEK



(STA 543+53)



(STA 543+65)

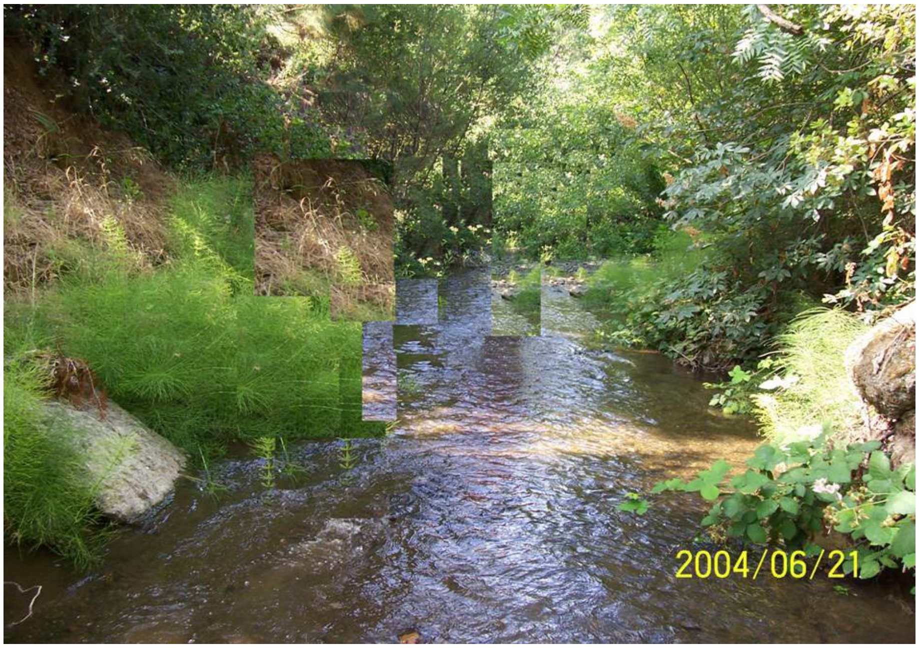


(STA 543+90)

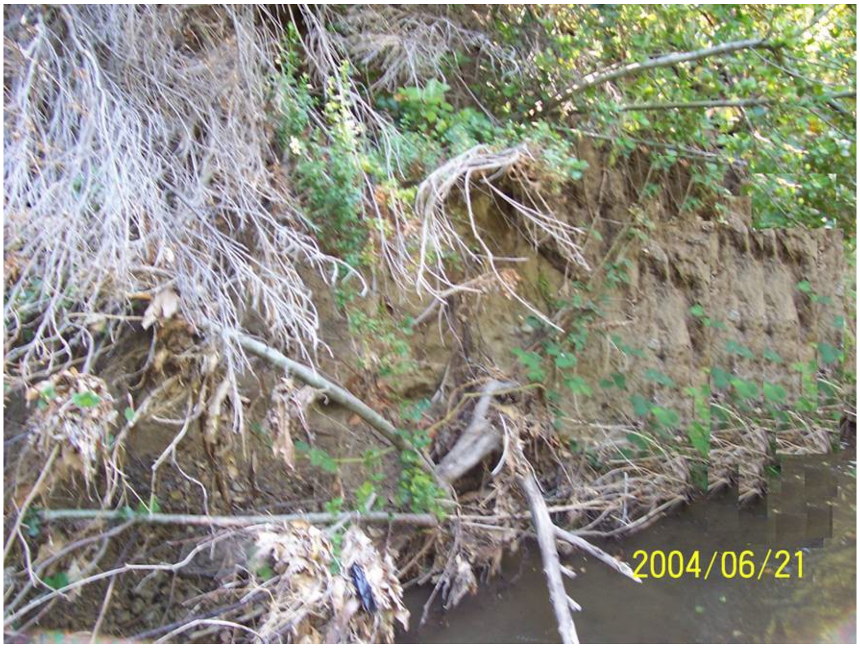
Channel Description:

The channel is a trapezoidal earth channel straight to some meandering alignment. Relatively narrow bottom width consists of gravel and some rocks. Bank slope erosion at the downstream end and further upstream some concrete pieces (old sidewalks, curbs, gutters and etc.) on the right bank slope.

CALABAZAS CREEK



Looking Upstream, fully vegetated with green and brownish vegetation
(STA 544+41)

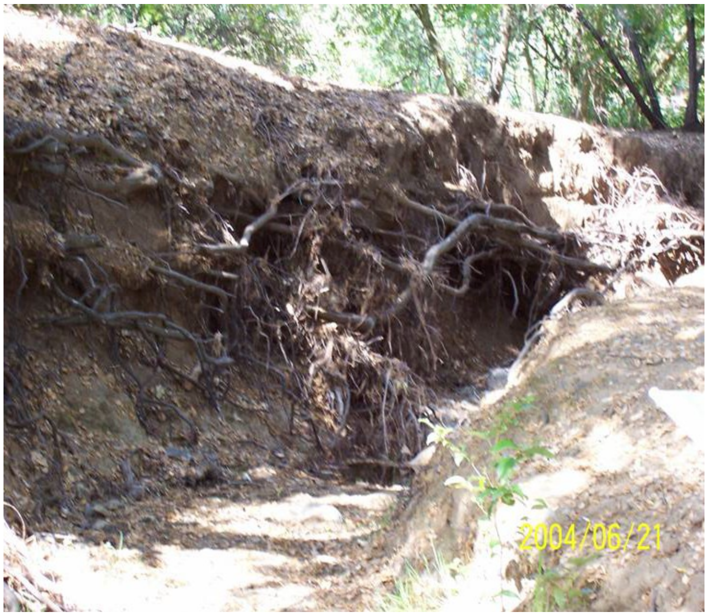


Looking Upstream, Erosion on the left bank (STA 545+26)

CALABAZAS CREEK

king Upstream, Prospect Creek on the right side (STA 546+34)

Looking upstream of Prospect Creek from Calabazas Creek (STA 546+46)

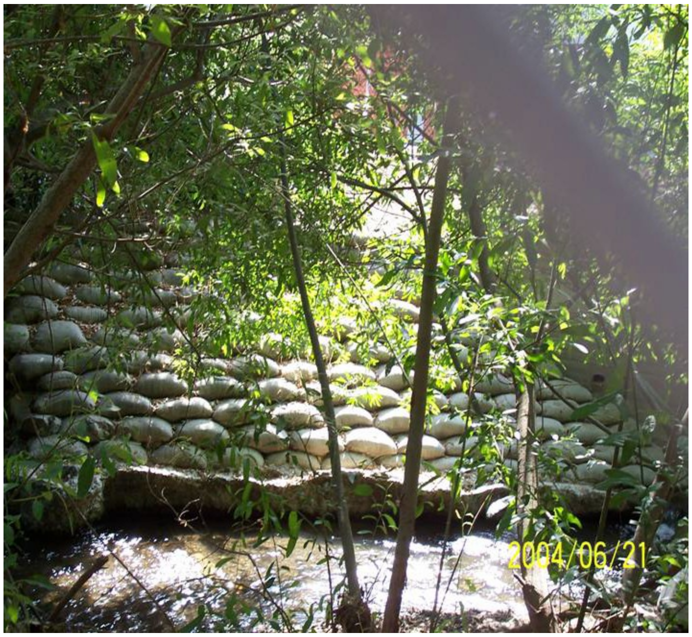


sion problems can be seen on the Prospect Creek. This photo is
king upstream into Prospect Creek. (STA 546+50) ±

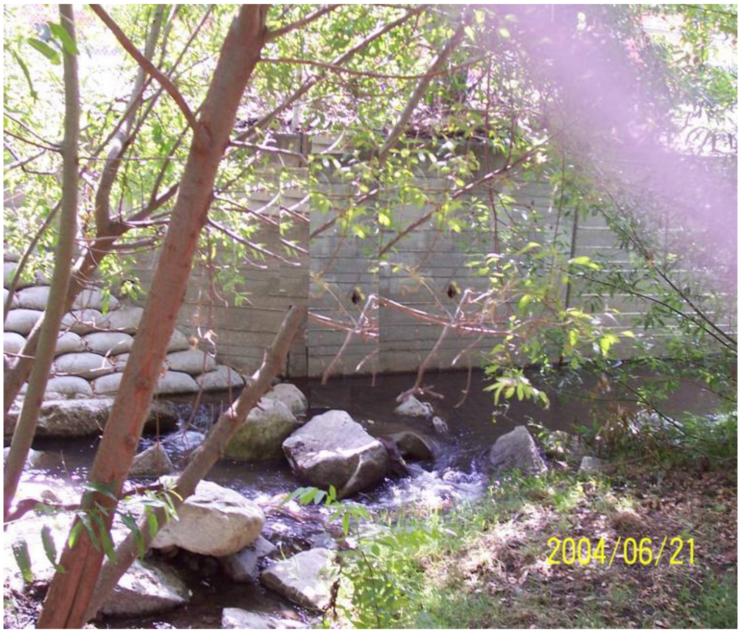
Calabazas Creek Looking downstream, Prospect Creek on the left side (STA 546+56)

Prospect Creek, one of the major tributaries which carries 600 cfs flow into Calabazas Creek and located approximately 170 feet downstream of UPRR. Prospect creek has natural banks with mature trees and some erosion on the bank slopes.

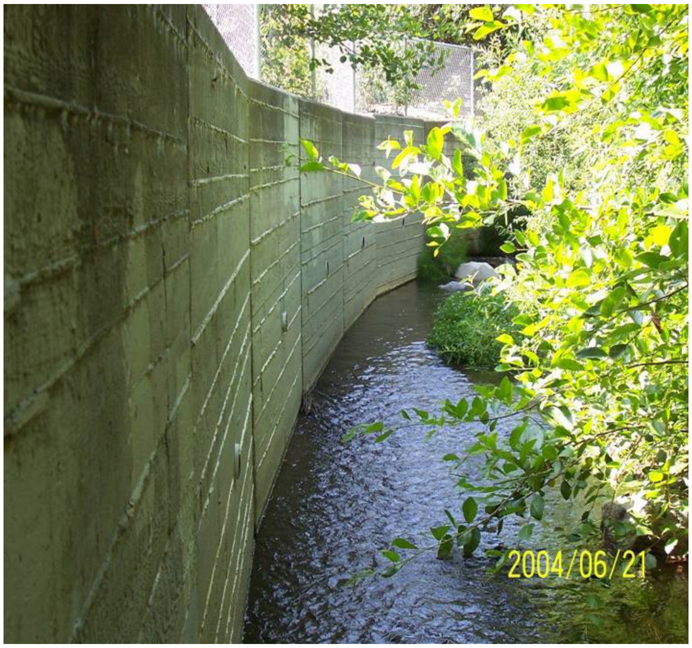
CALABAZAS CREEK



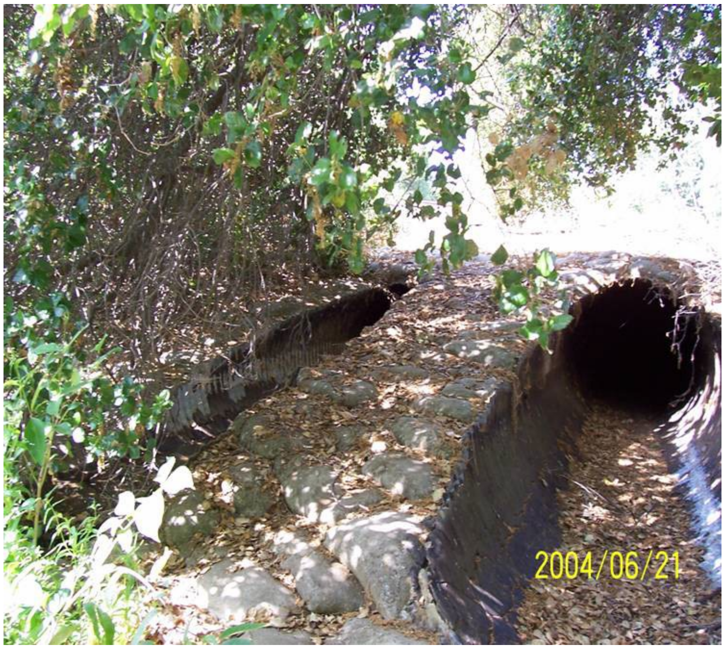
oking Upstream, left bank scour problem under sack concrete
A 547+04)



Looking Upstream, left bank (STA 547+04) ±



oking Upstream, left bank (STA 547+48) ±

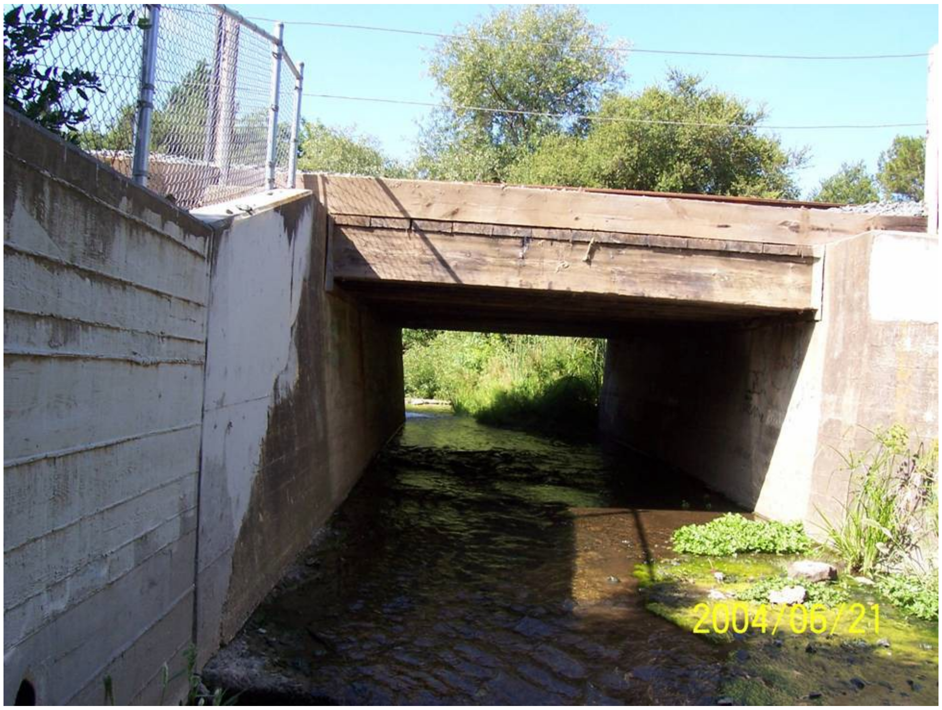


Looking Upstream, right bank (STA 547+48)

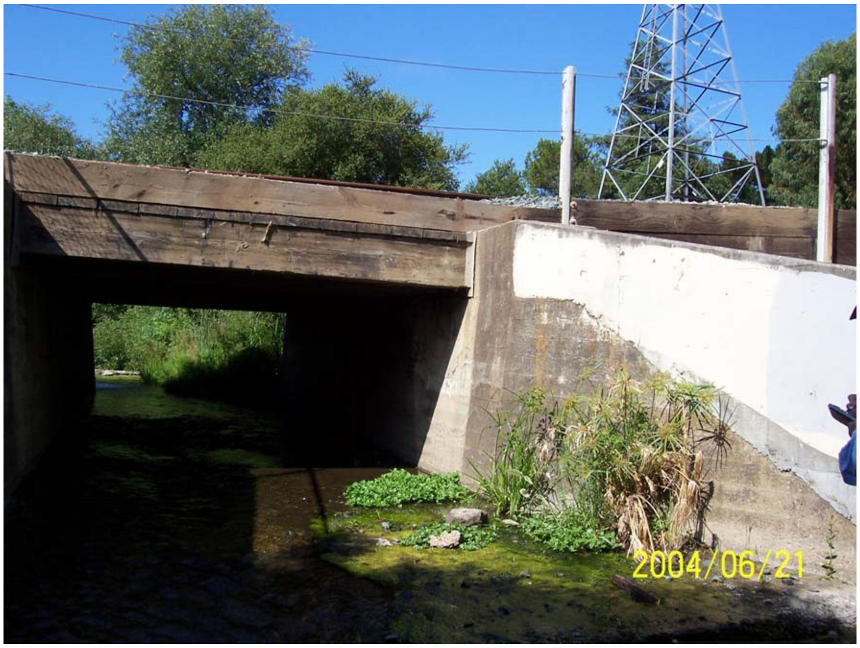
Channel Description:

Downstream of UPRR, right bank includes 2 outfalls (36” & 48” diameter) within sack concrete slope protection. Left bank is covered with sack concrete and further upstream concrete retaining wall. Relatively invert is narrow with big piece of rocks

CALABAZAS CREEK



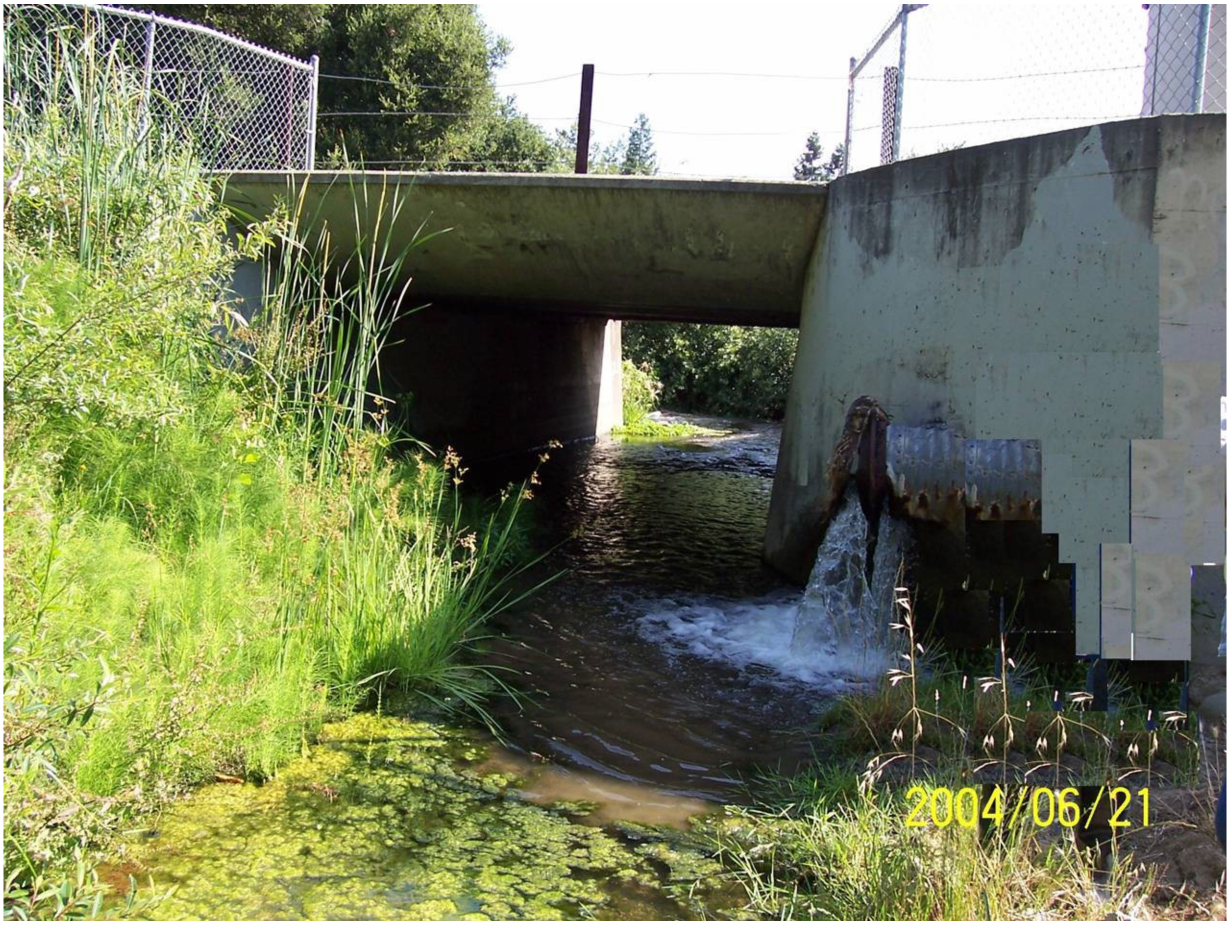
(STA 548+00)



(STA 548+00)

Looking Upstream, downstream of UPRR Culvert with wooden headwall, concrete wing walls and natural invert

CALABAZAS CREEK



Looking Downstream, upstream of UPRR Culvert with concrete headwall and an outfall (pump station) on the right bank. (STA 548+86)

REACH 32

Reach 32: Upstream of Union Pacific Railroad (UPRR) Culvert to upstream of Wardell Road Culvert (Sta 548+63 to Sta 571+40.8)

Reach Description:
This reach is a trapezoidal natural earth channel mainly straight and some curve alignment. Upstream of the UPRR is relatively wide channel with shallow top of banks. East bank is covered with big rocks while west is just firm soil. Further upstream of this reach both west and east bank slopes are eroded rock filled soil with scattered trees on top of the banks. In some other area both banks are covered with sacked concrete slope protection. Downstream of Wardell, the channel invert is covered with big rocks forming a sloped drop structure and fully vegetated with mature trees.

Wardell Culvert is a 25 feet long single box culvert with 20 feet in width.

The entire reach is located within the City of Saratoga. Distinctive features in this reach include a pump station on the east bank upstream of UPRR, an outfall within the upstream east wing wall. One of the sack concreted erosion sites has a large erosion tunnel developing behind it (between the sack concrete and the soil bank) that will need to be repaired.

Right-of-Way: The District does not possess enough right of way at the location shown in the following table. Refer to Figure 11 for details.

Table 6: Insufficient right of way location within reach 32

Reach	Beginning Station	Ending Station	Length	Properties where District has insufficient ROW
32	563+15	563+95	80	2 residential
	568+00	571+00	300	

Reach Average Invert Slope: Approximate average slope for this reach is 0.009 (from Sta 548+63 to Sta 571+16.5)

1% Flow:
1200 cfs – UPRR (Sta 548+63) to Wardell Road (Sta 571+40.8)

10% Flow:
580 cfs - UPRR (Sta 548+63) to Wardell Road (Sta 571+40.8)

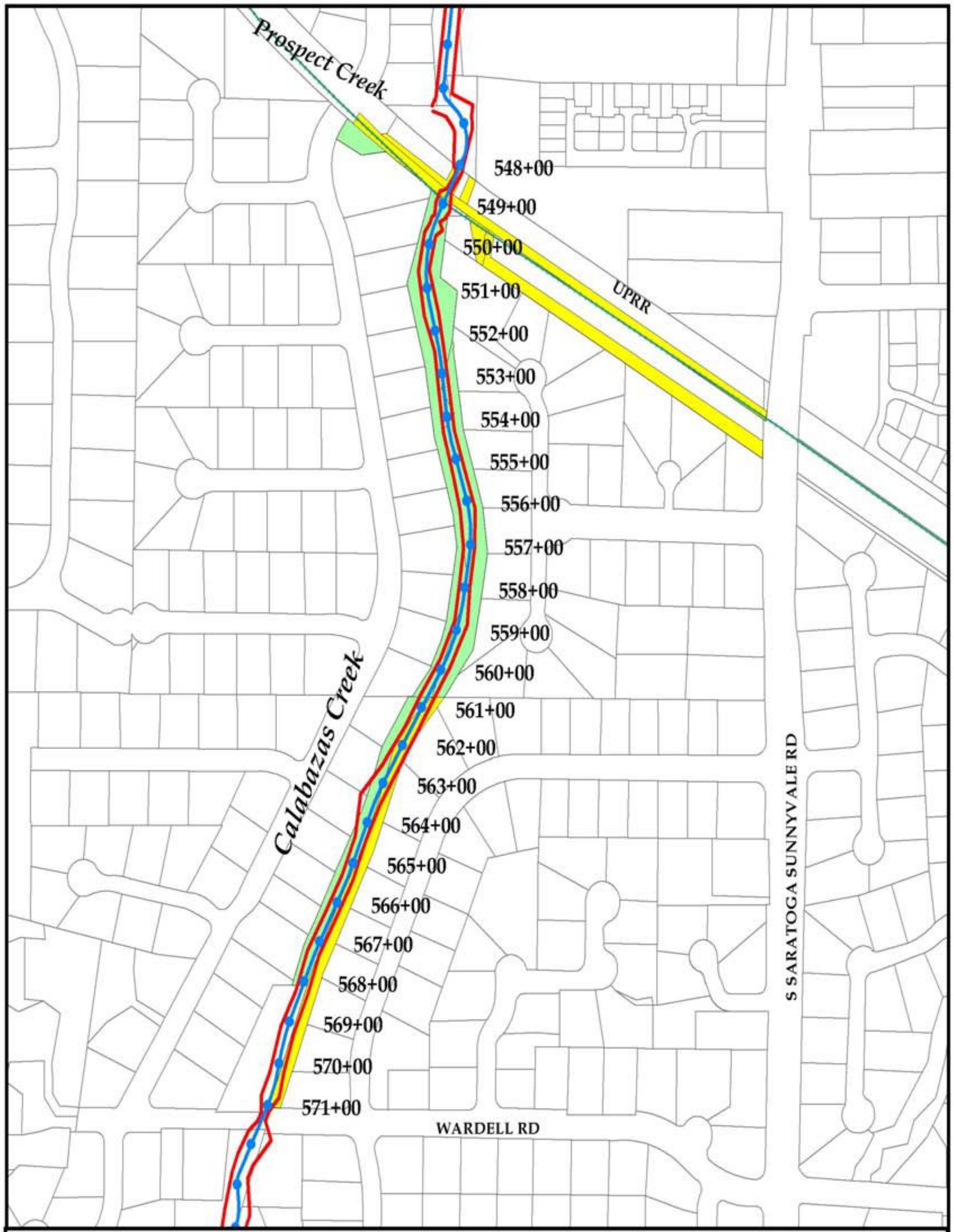
Current Reach Capacity: Between Sta 548+63 and Sta 555+27.6 the channel current capacity is 580 cfs. Rest of the reach has the capacity to convey 1% flow (1200 cfs) from upstream of Wardell to upstream of UPRR. The range of water surface elevation above the top of the bank for this area is between 0.2’ – 4.3’.

Reach Flooding area Profiles: See Appendix A, Hydraulic Report (Floodwater Breakout Points map and Profile 5 for the flooding area).

Reach Roughness Coefficient: For this report, the roughness coefficient of .05 for natural channel, .044 for rock bed, and .036 for sack concrete was used. For areas with concrete material (bridges and wing walls and ect.), the roughness coefficient was .015.

Reach Typical Photos: See the following pages for typical photos and their channel descriptions. Pagination of photos is 32-1 to 32-14. For location and stationing see Figure 11.

Reach Erosion Problem: Several erosion sites (sever to moderate) were found in this reach. See the following photos for the location and more details.



Calabazas Creek
Reach 32
UPRR to Wardell Rd.

Figure 11

Top of Bank

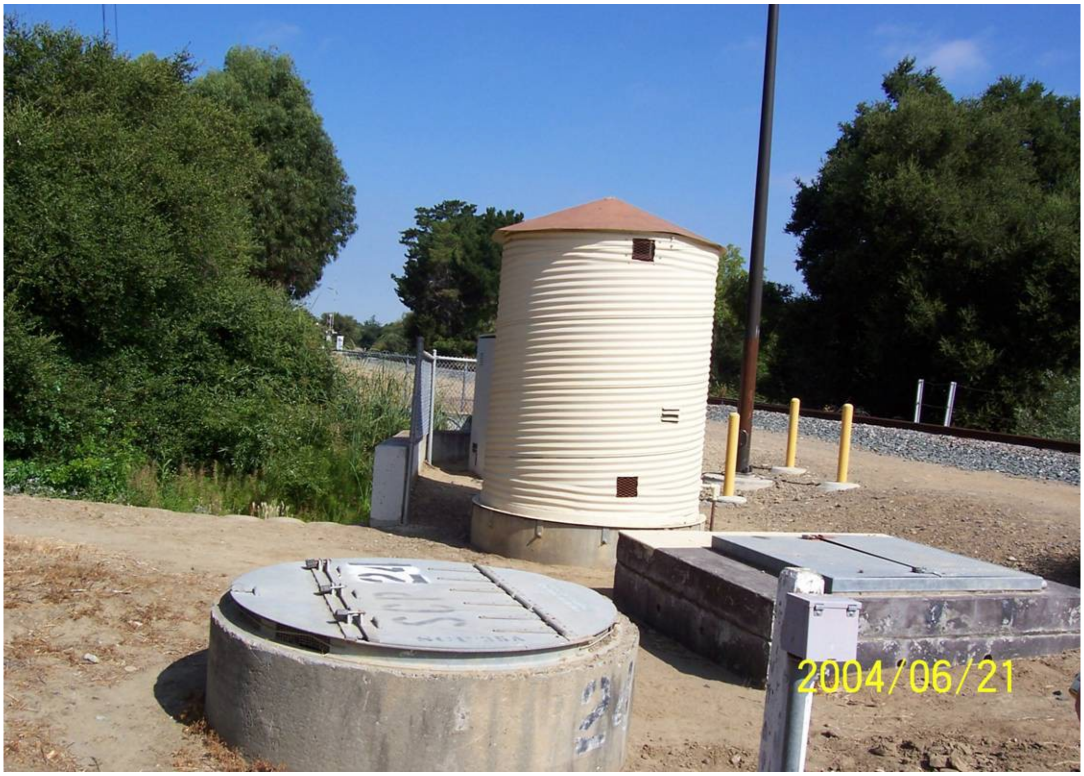
Control Line

🟩 SCVWD Fee

🟨 SCVWD Easement

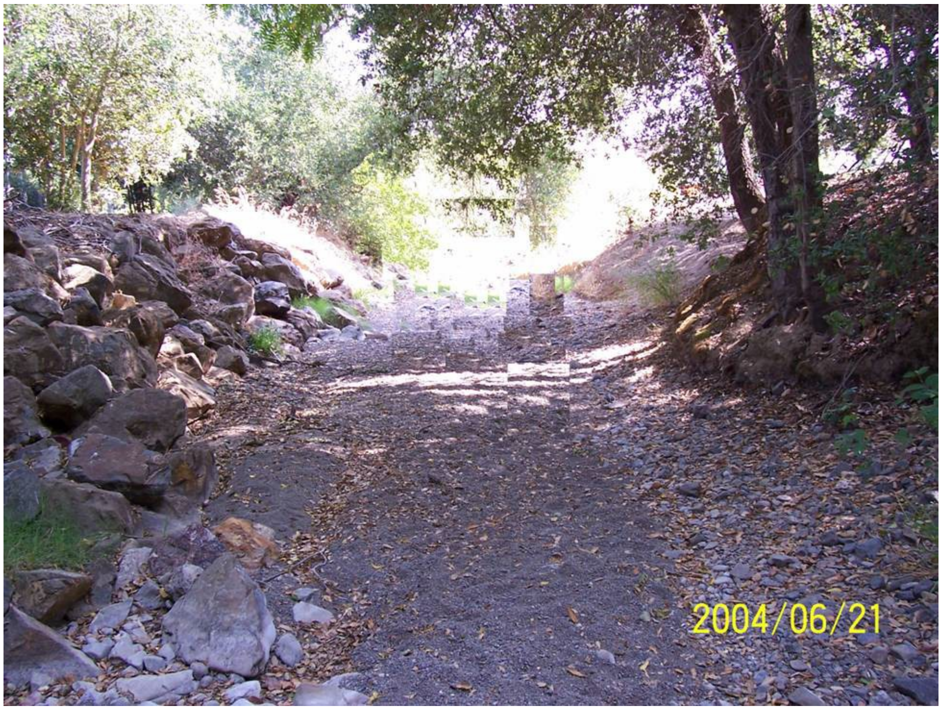
80 0 80 160 Feet

CALABAZAS CREEK

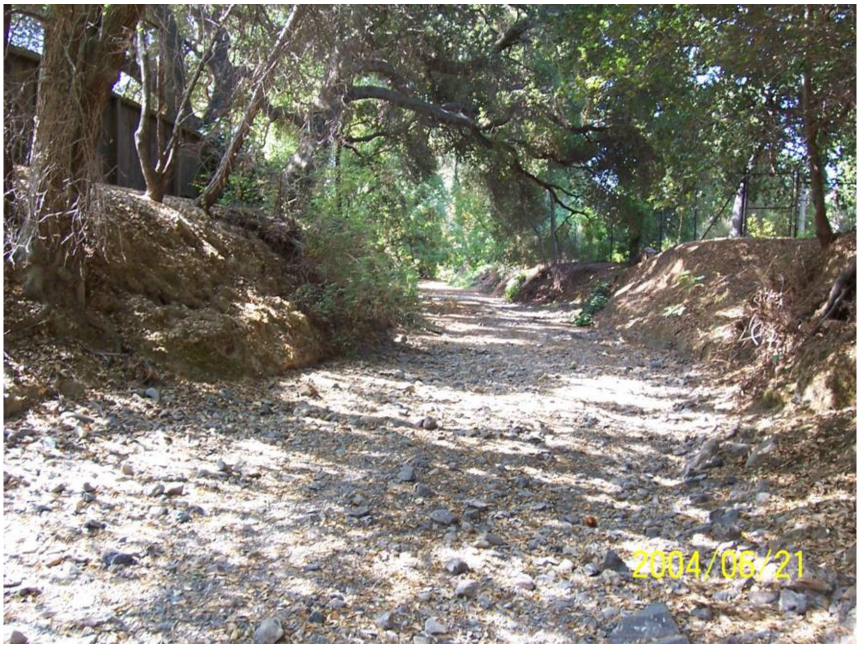


Ground water pump on top of the outfall at upstream of UPRR (STA 548+90)

CALABAZAS CREEK



Looking Downstream toward UPRR (STA 549+70)

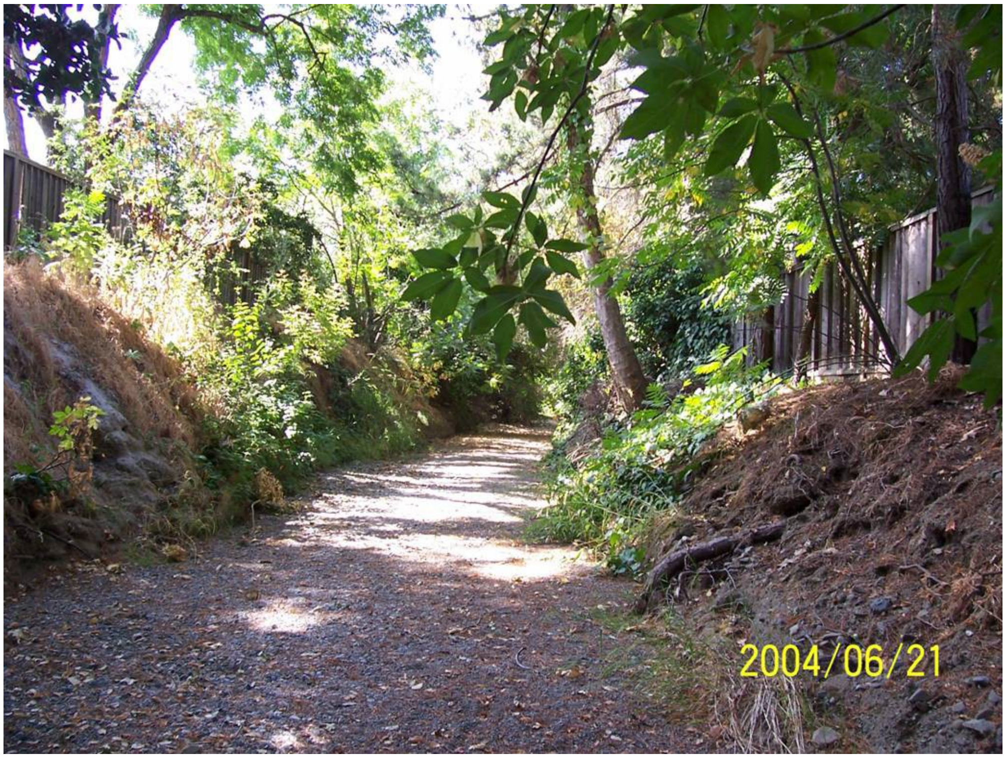


Looking Upstream (STA 549+70)

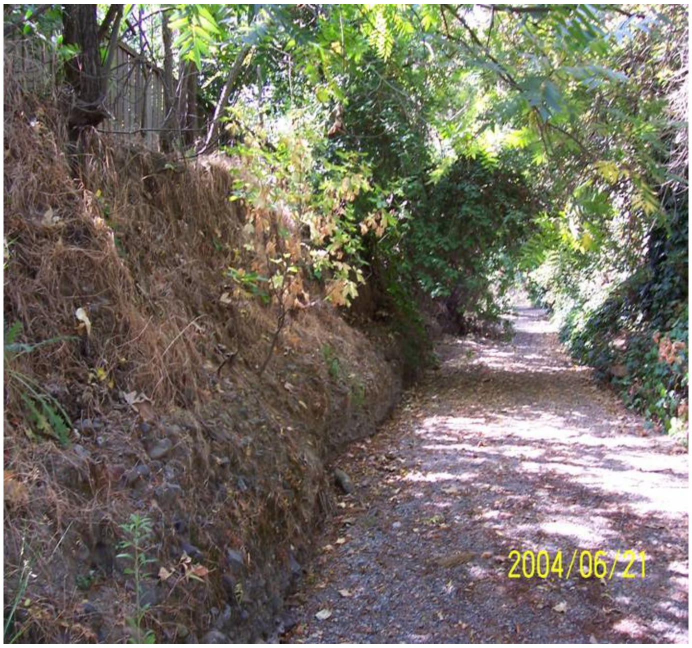
Channel Description:

An earth trapezoidal channel with mainly straight to some meandering alignment. Invert is consists of gravel and cobbles. Scattered mature trees on top of both banks. Right bank slope is covered with rocks for bank protection. Both bank slopes in most area have erosion problem.

CALABAZAS CREEK



Looking Upstream (STA 551+97)



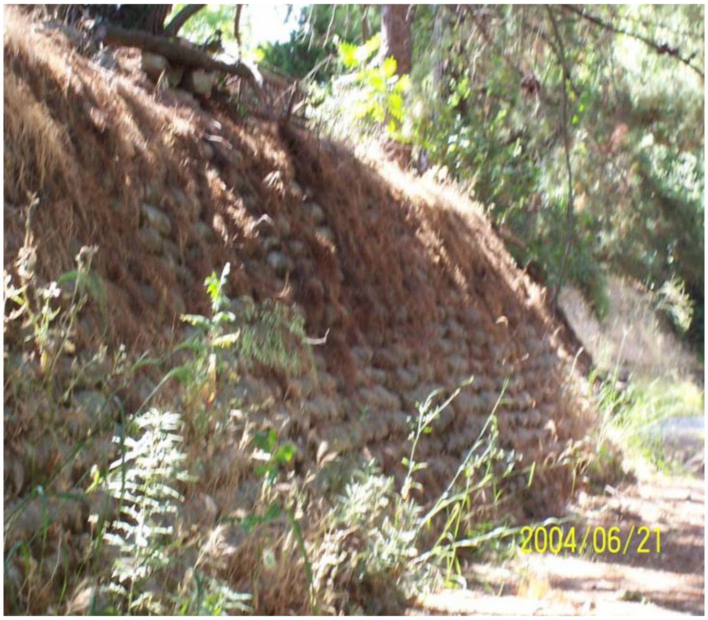
oking Upstream (STA 552+33)

Looking Upstream (STA 554+00)

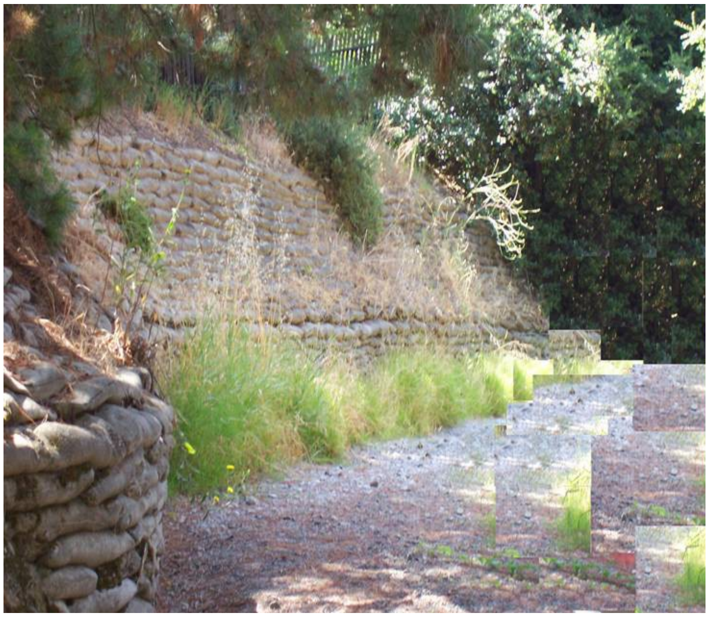
annel Description:

e channel is a straight, trapezoidal natural earth channel. Both east and west bank slopes are eroded rock filled soil. ry few trees on top of the both banks. Property fence line is very close to the top of the banks on both sides. Invert aterial consists of sand and gravel

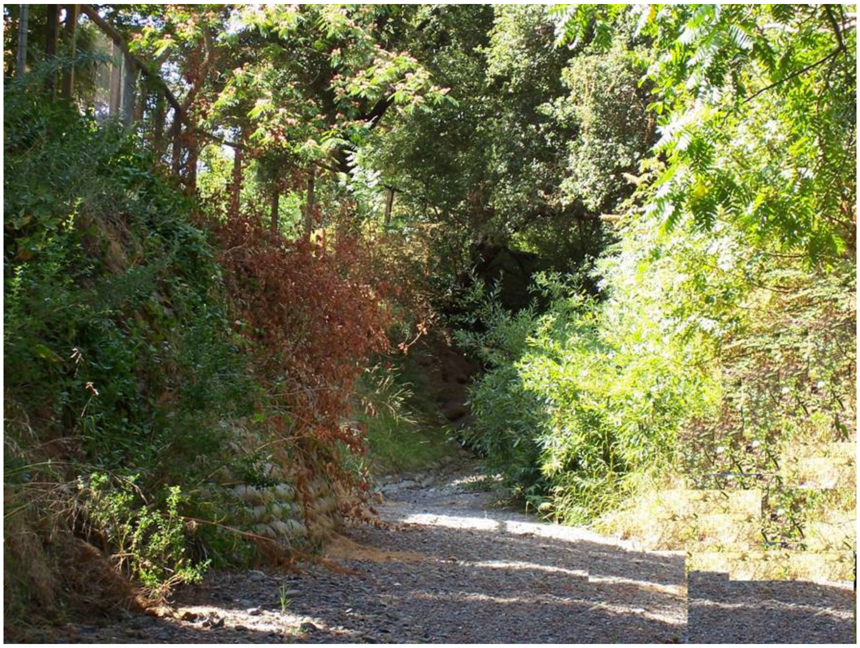
CALABAZAS CREEK



A 554+71)



(STA 555+21)



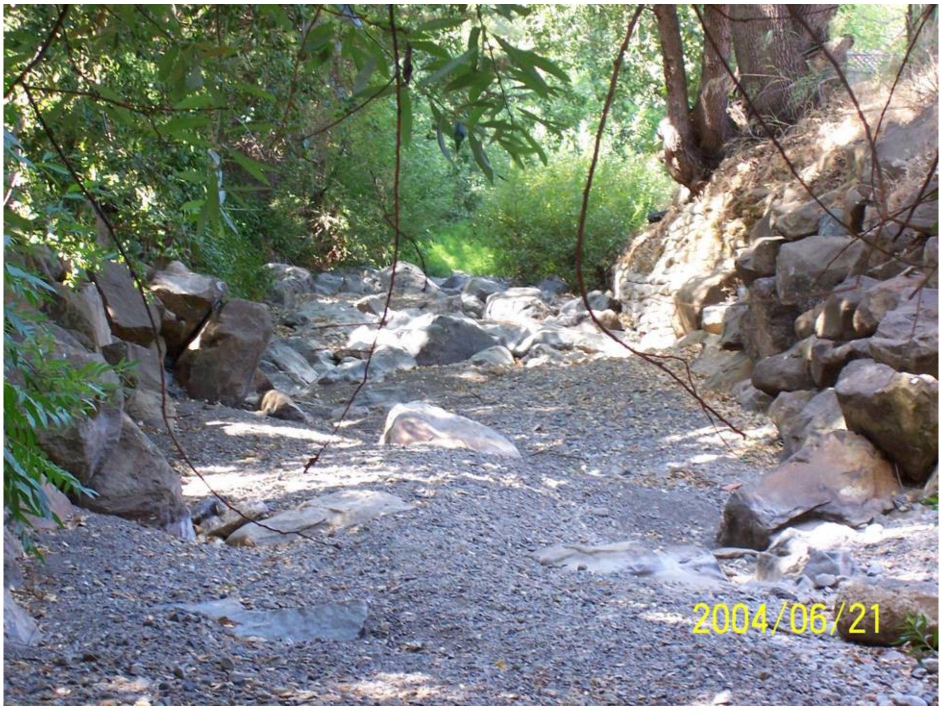
(STA 558+10)

Looking Upstream

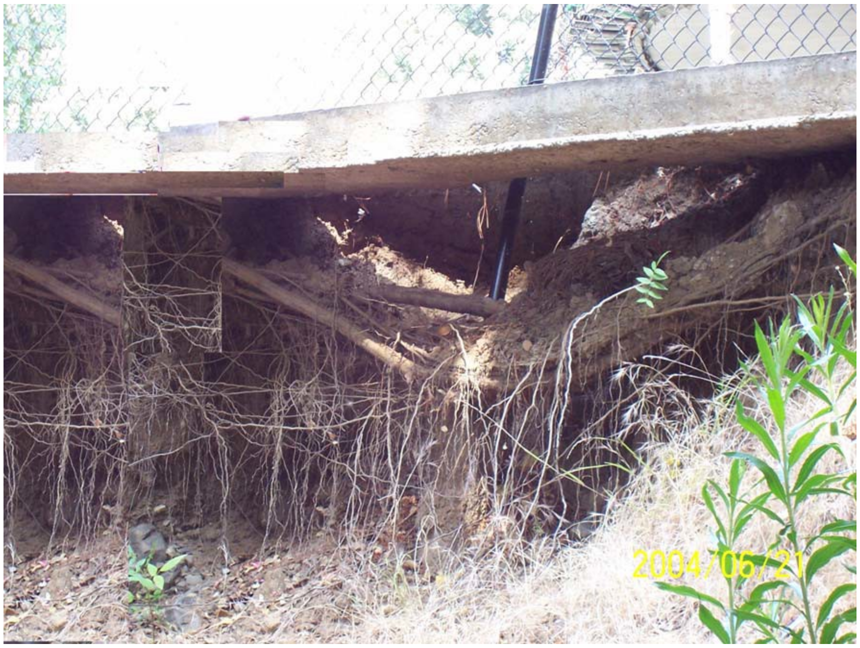
Channel Description:

The channel is earth has straight alignment with trapezoidal shape. West bank consists of sacked-concrete slope protection, while the east bank is vegetated earth. Invert material is mostly sandy and fine gravel.

CALABAZAS CREEK

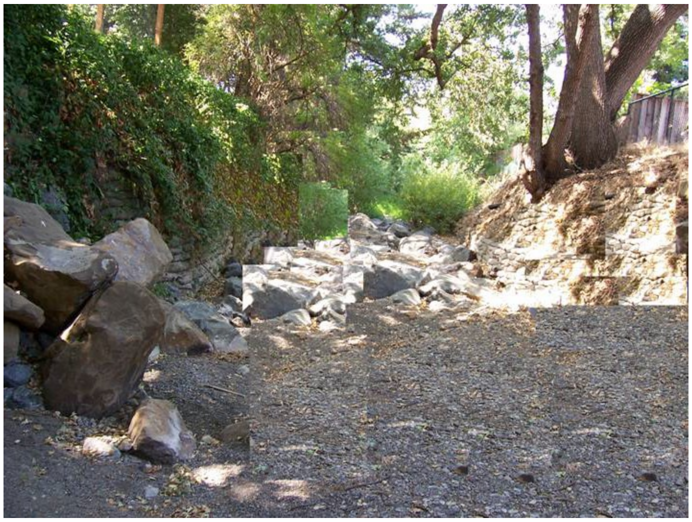


Looking Upstream, rock rip rap on the bank slopes and invert (STA 559+33)

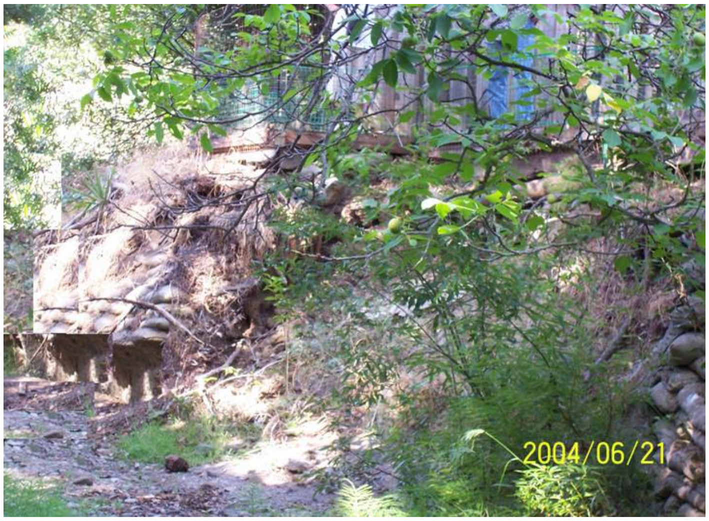


Looking Upstream, right bank erosion under concrete that was dumped in this area. (STA 559+33)

CALABAZAS CREEK

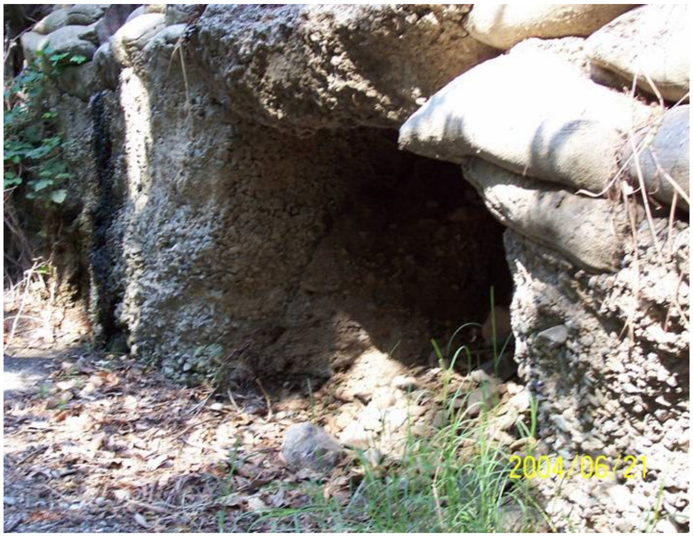


'A 559+61)



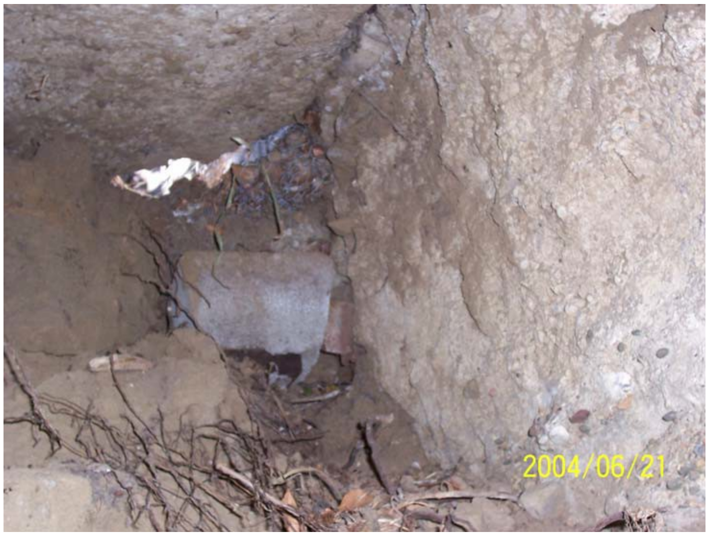
2004/06/21

(STA 1560+40)



2004/06/21

sion problem - a hole extending from top of the sacked concrete to bottom of the sacked concrete on the right bank (STA 560+75)



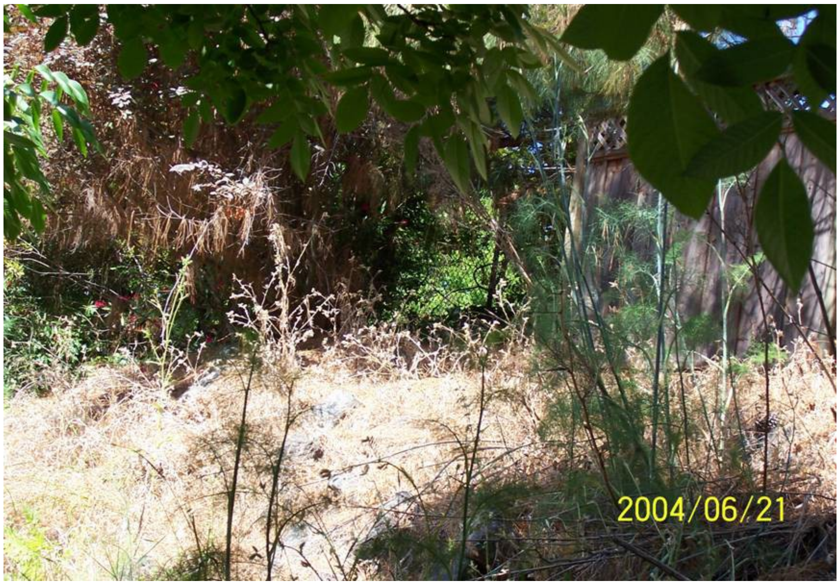
2004/06/21

Inside the hole, that is behind the sack concrete from top to bottom (STA 560+75)

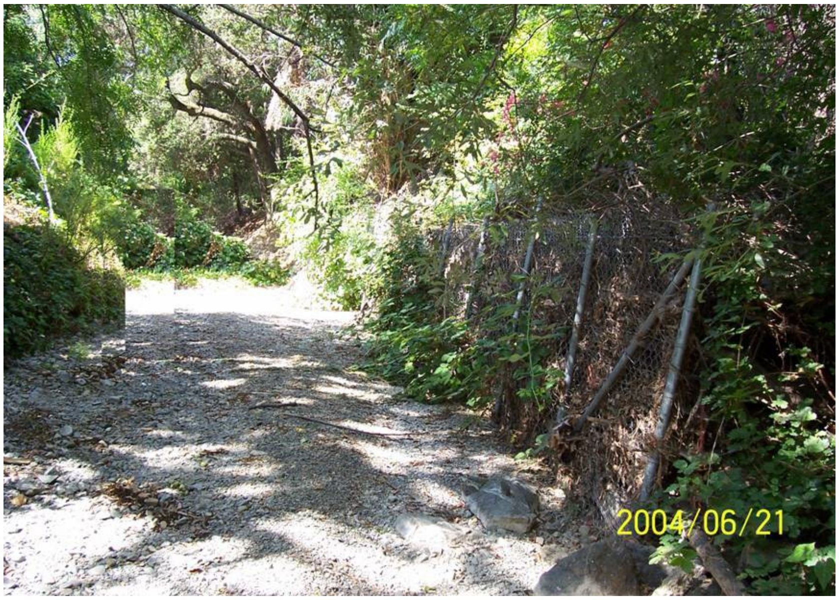
Channel Description:

The channel is a trapezoidal with straight alignment. Both east and west banks are covered with sacked concrete which consists of limited vegetation. In some area right bank slope has erosion problem. Channel invert is covered with big rocks.

CALABAZAS CREEK



Looking Upstream, right bank-wooden fence change to chain link fence (STA 562+14)

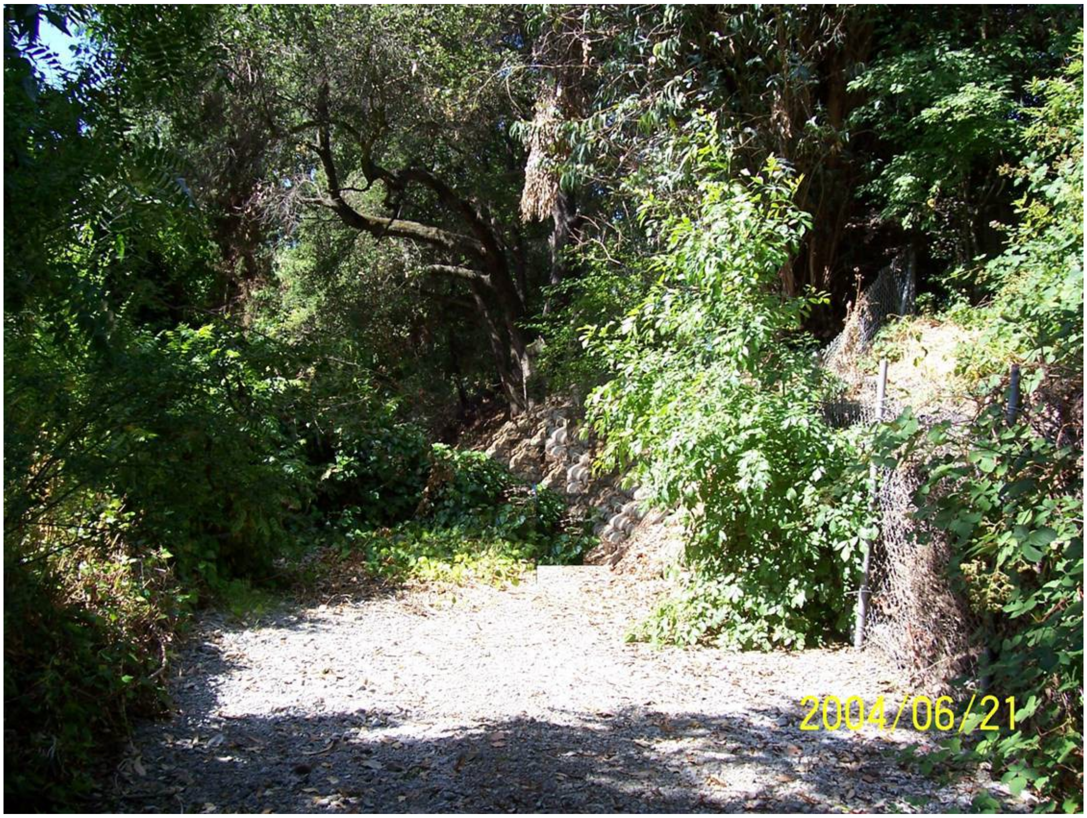


Looking Upstream, right bank-District's chain link fence in the creek to stop bank erosion (STA 562+69)

Channel Description:

The channel is an earth trapezoidal with mostly straight alignment. Bank slopes vegetations on both sides varies from brownish grass to some mature trees. The channel bottom material is mostly sandy and gravel.

CALABAZAS CREEK

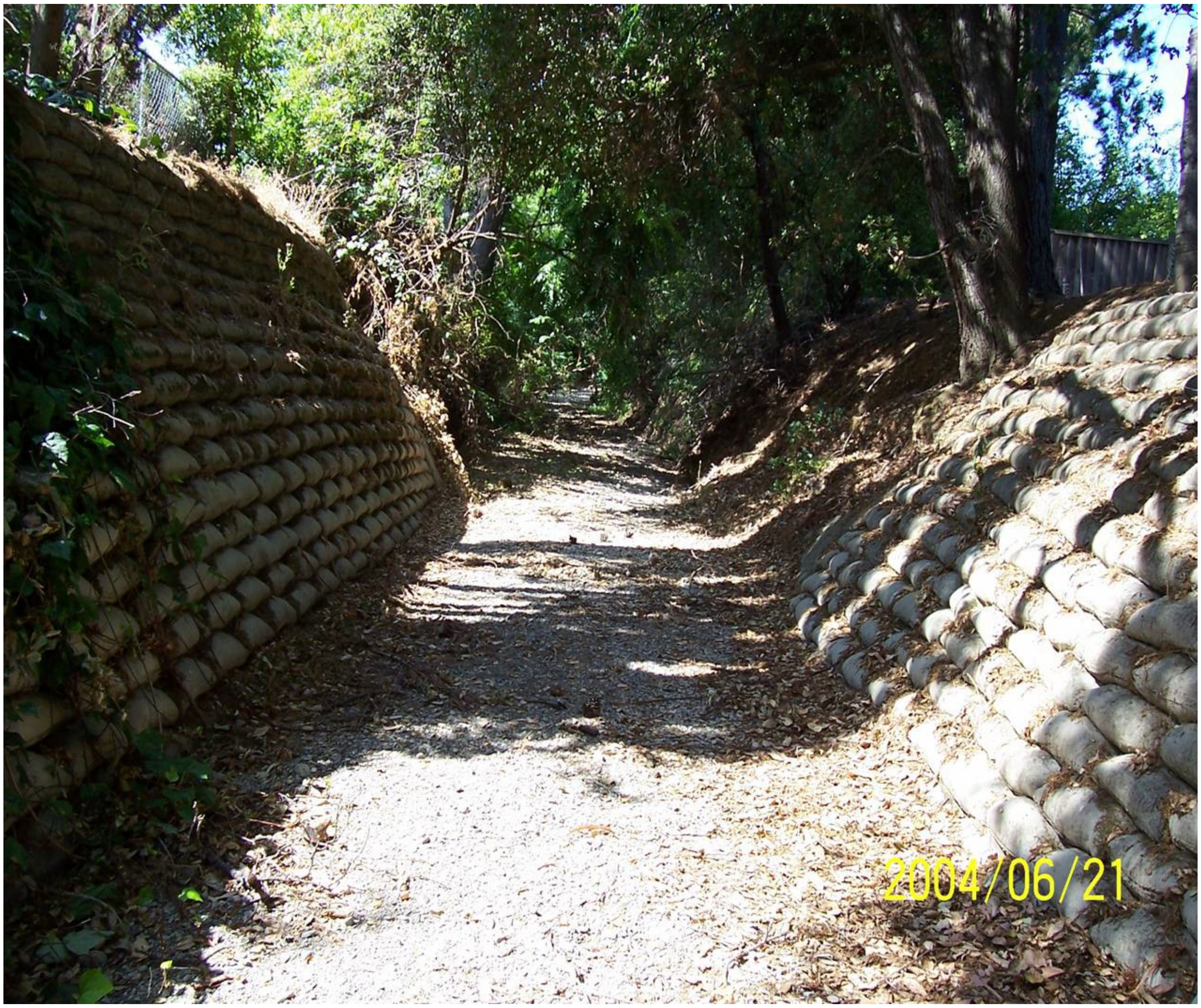


Looking Upstream, stop fence start sack concrete on the right bank (STA 563+26)

Channel Description:

The channel is natural , trapezoidal and straight in alignment. The channel is fully vegetated specially on the west bank with mature trees and undergrowth vegetation. Channel bottom is covered with sand and gravel.

CALABAZAS CREEK

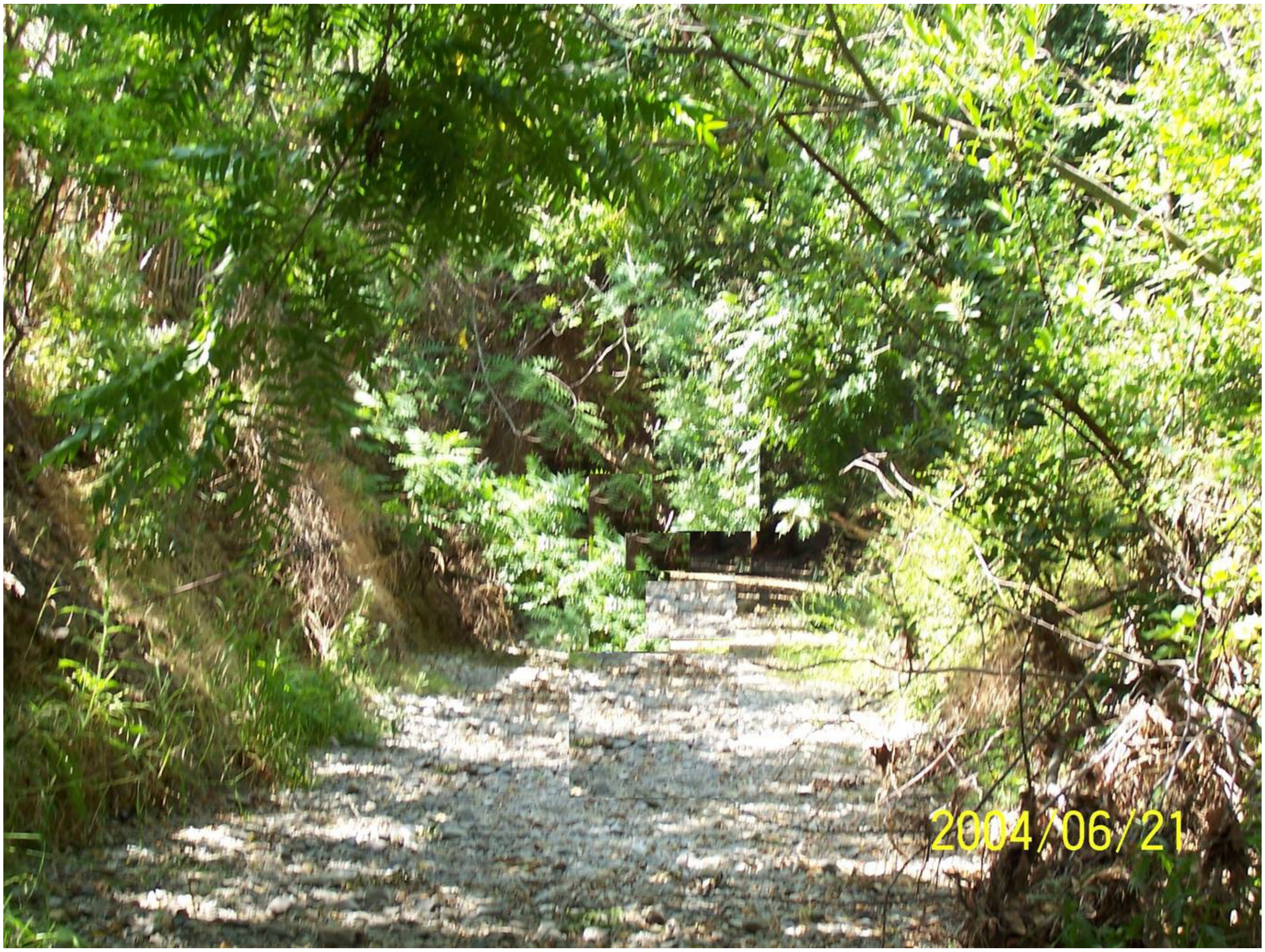


Looking Upstream (STA 563+62)

Channel Description:

The channel is trapezoidal and straight in form. Both bank slopes are covered with sacked-concrete and scattered mature trees on top of the banks. Channel invert is consists of gravel and sand.

CALABAZAS CREEK

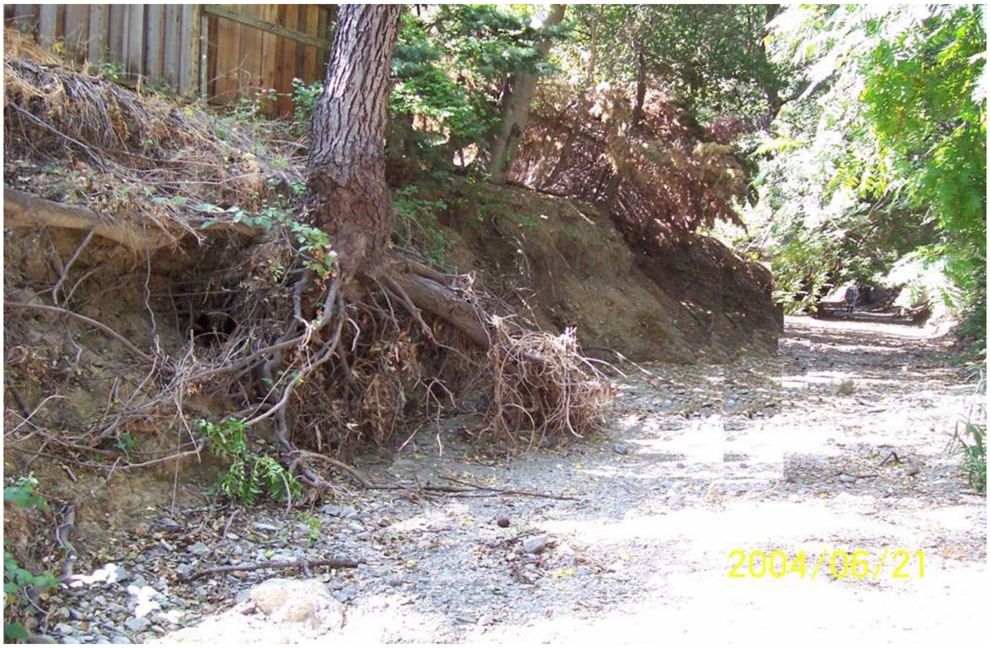


Looking Upstream (STA 565+03)

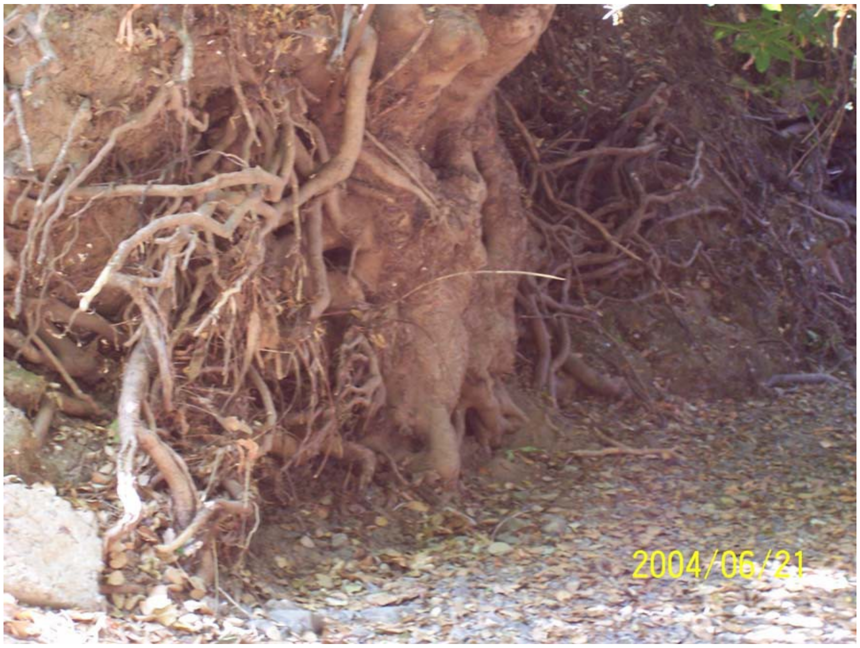
Channel Description:

The channel is natural, trapezoidal and straight in form. Both bank slopes are vegetated with scattered trees, shrubs and some undergrowth. Invert is consists of coarse and fine gravel.

CALABAZAS CREEK



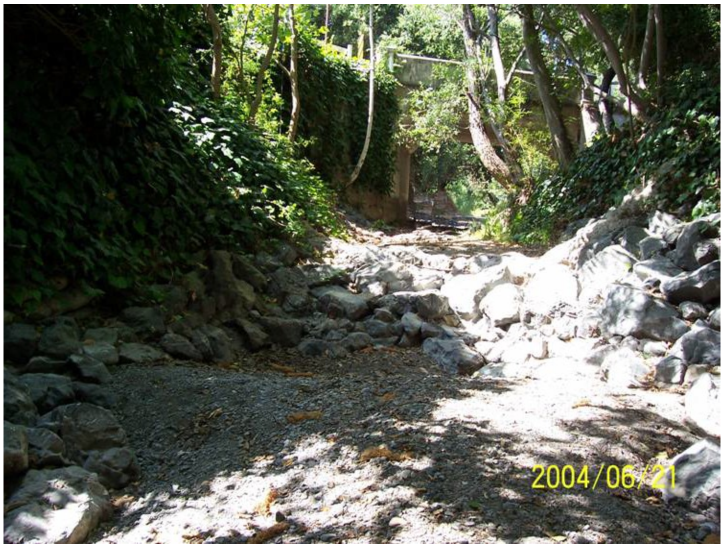
(STA 565+64)



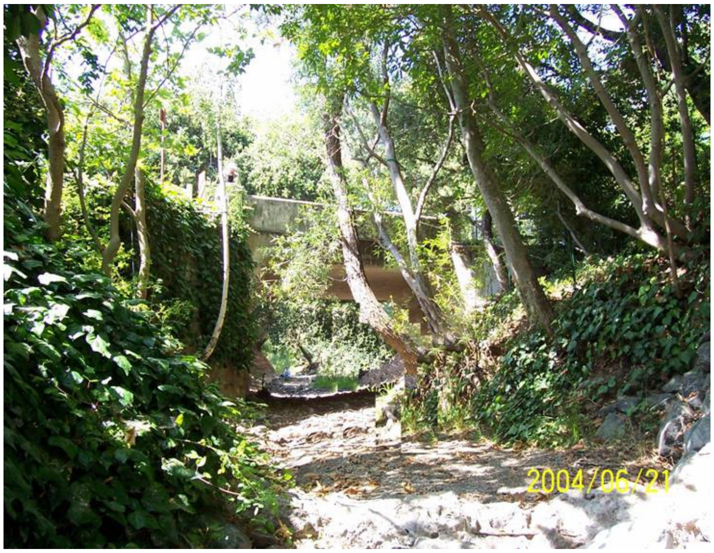
(STA 566+52)

Looking Upstream, erosion on the left bank

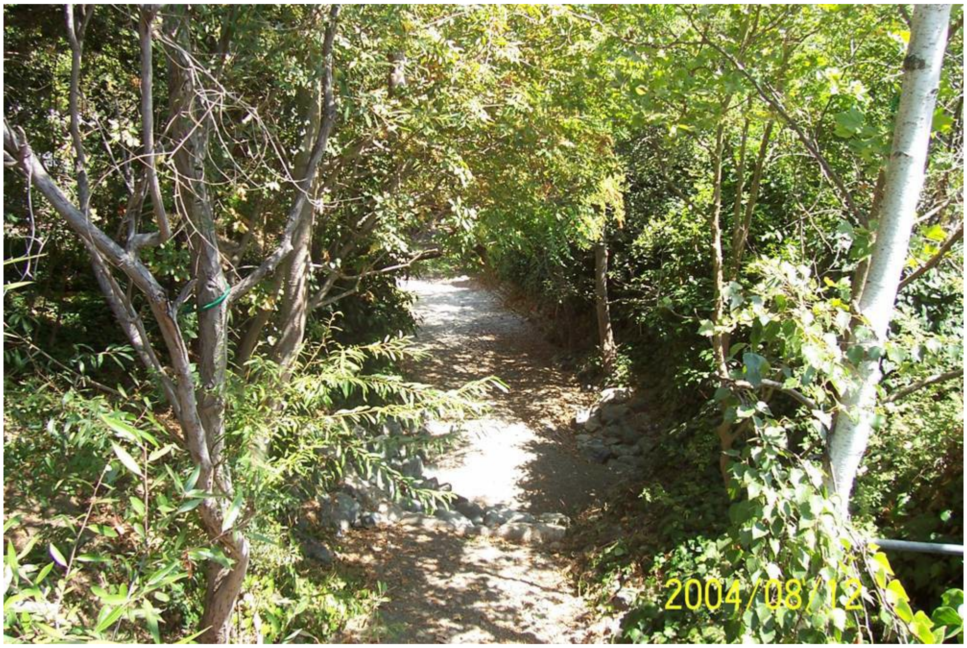
CALABAZAS CREEK



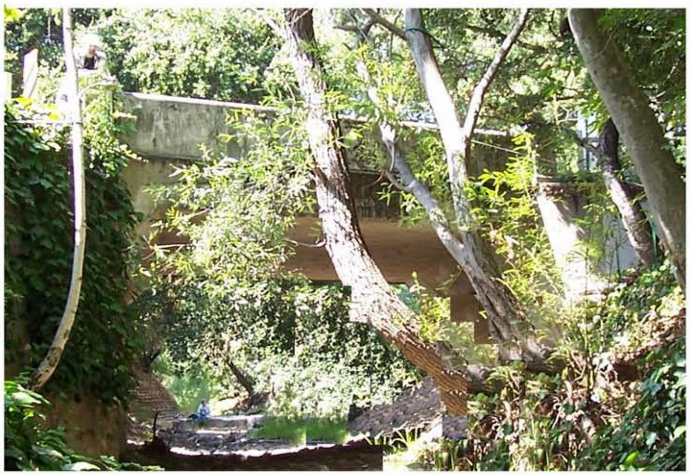
ɔking Upstream, downstream of wardell culvert, a drop structure (rock rap) located on the channel invert (STA 570+52)



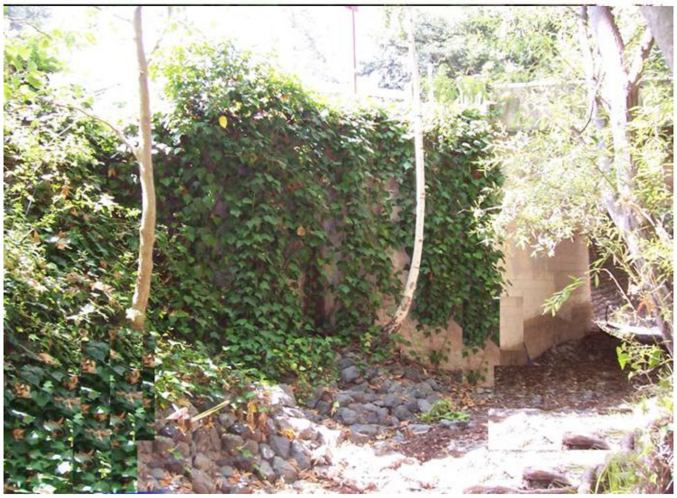
Looking Upstream, downstream of Wardell culvert, channel is vegetated w some trees and ivy and bare soil in some area. (STA 570+72)



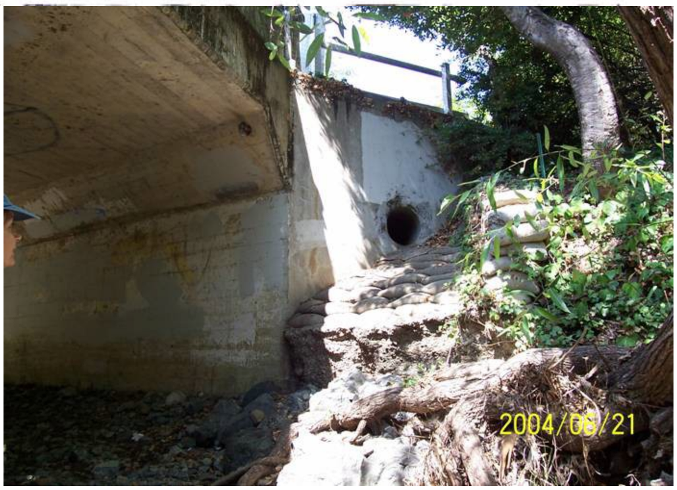
Looking Downstream, downstream of Wardell culvert (STA+571+20)



Looking Upstream, downstream of Wardell Culvert

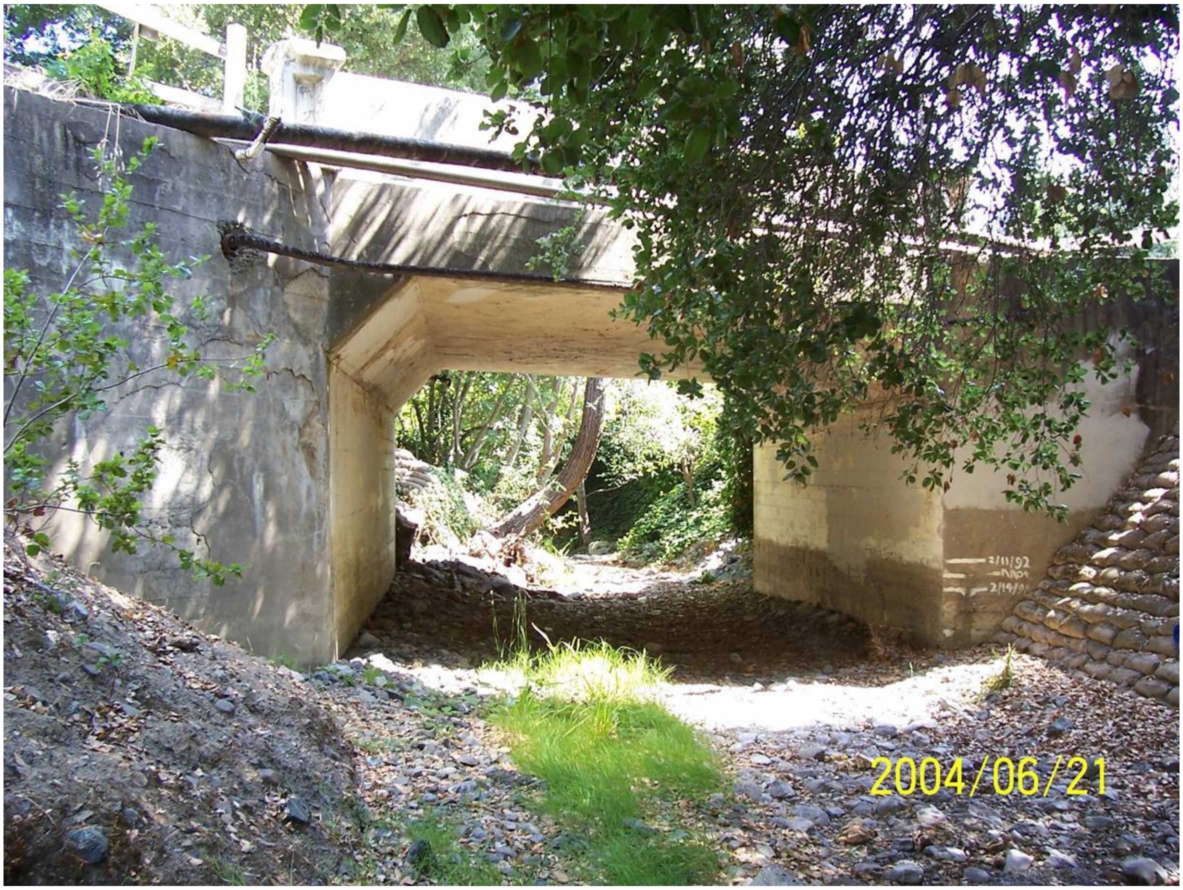


king Upstream, downstream of Wardell culvert left bank (STA
+86)



Looking Upstream, downstream of Wardell culvert-outfall and sacked concrete within the east wing wall (STA 570+86)

CALABAZAS CREEK



Looking Downstream, upstream of Wardell concrete Box Culvert (STA 571+70)

REACH 33

Reach 33: Upstream of Wardell Road Culvert to upstream of Comer Drive Bridge
(Sta 571+40.8 to Sta 594+13.4)

Reach Description:
The earth trapezoidal shaped channel varies from straight to sinuous alignment. Upstream of Wardell Road, west bank is covered with sacked concrete and natural earth on the east bank. Top of the both banks are fully vegetated with mature trees. Further upstream, steep slope with sacked concrete covered with some ivy on the right bank and left bank is fully vegetated on firm soil. Some areas have right bank slope erosion problems.

The Comer Drive Bridge is a 29 feet long clear span bridge. The bridge is 30.5 feet in width.

The entire reach is located within the City of Saratoga. Distinctive features in this reach include a debris basin located downstream of Comer bridge, a 18" outfall on the west wing wall of the Comer Drive bridge and a 10" outfall under the sacked concrete on the east wing wall of the Comer bridge.

Right-of-Way: The District does not possess enough right of way at the locations shown in the following table. Refer to Figure 12 for details.

Table 7: Insufficient right of way locations within reach 33

Reach	Beginning Station	Ending Station	Length	Properties where District has insufficient ROW
33	576+10	576+90	80	1 residential
	581+65	583+25	160	1 residential
	584+20	586+80	260	2 residential
	587+20	588+40	120	1 residential
	589+10	589+40	30	1 residential

Reach Average Invert Slope: approximate average slope for this reach is 0.015 (from Sta 571+40.8 to Sta 593+82.9)

1% Flow:
1200 cfs – Wardell Road (Sta 571+40.8) to Comer Drive (Sta 594+13.4)

10% Flow:
580 cfs - Wardell Road (Sta 571+40.8) to Comer Drive (Sta 594+13.4)

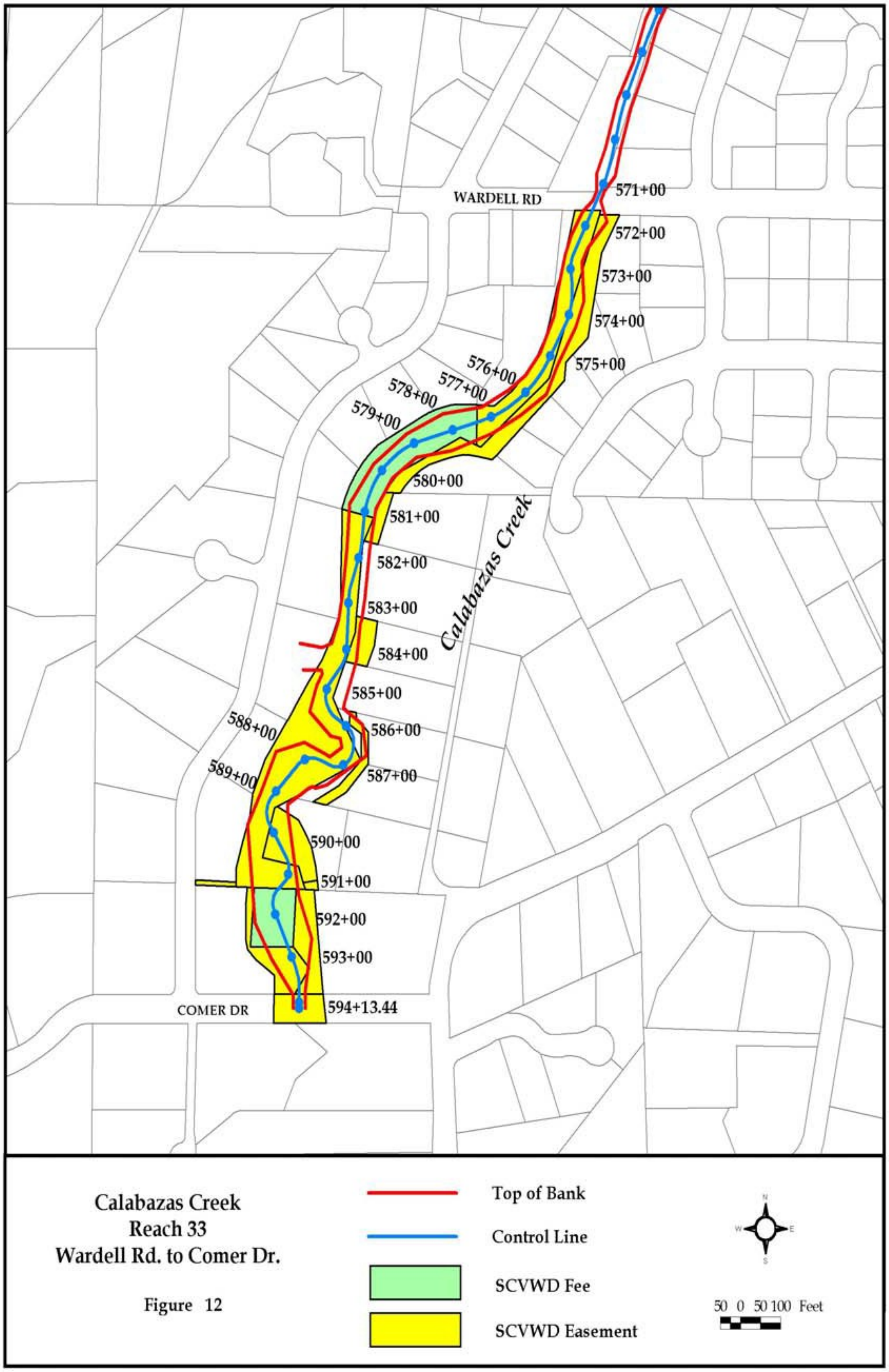
Current Reach Capacity: The reach has the capacity to convey 1% flow (1200 cfs) from upstream of Comer Drive to upstream of Wardell Road.

Reach Flooding area Profiles: No flooding issues exist for this reach.

Reach Roughness Coefficient: For this report the roughness coefficient of .05 for natural channel, .044 for rock bed, and .036 for sack concrete was used. For areas with concrete material (bridges and wing walls and ect.), the roughness coefficient was .015.

Reach Typical Photos: See the following pages for typical photos and their channel descriptions. Pagination of photos is 33-1 to 33-11. For location and stationing, see Figure 12.

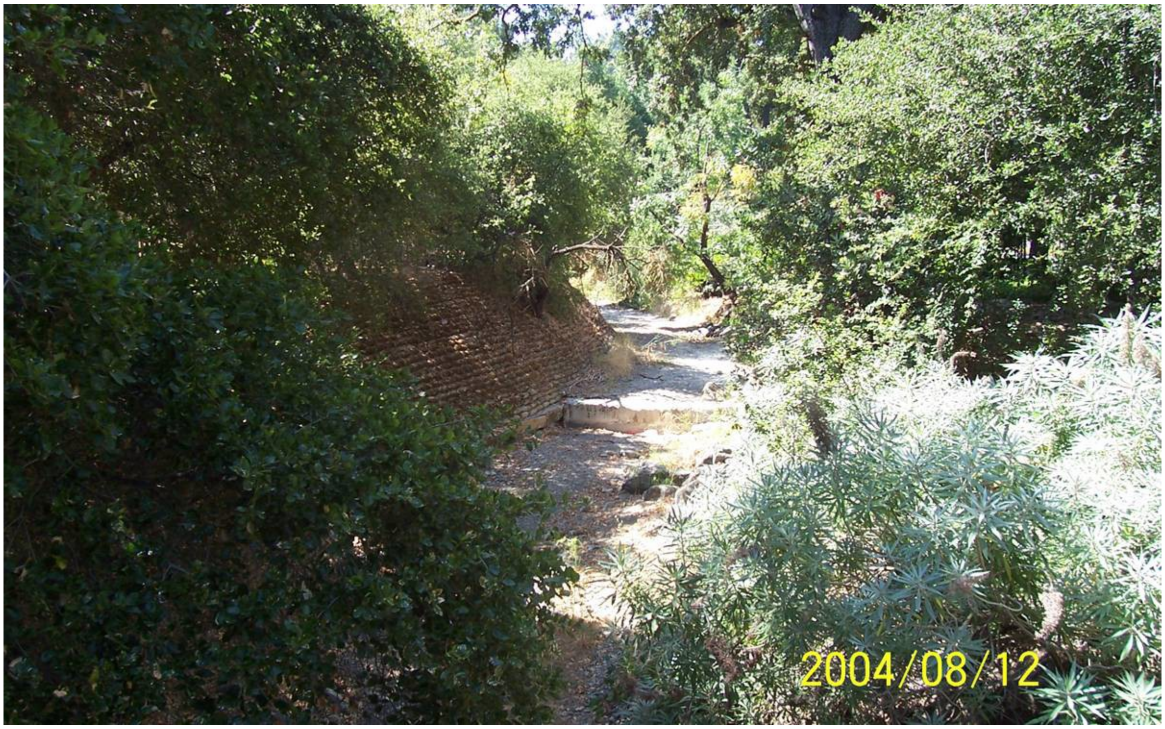
Reach Erosion Problem: Several erosion sites (severe to moderate) were found in this reach. See the following photos for the location and more details.



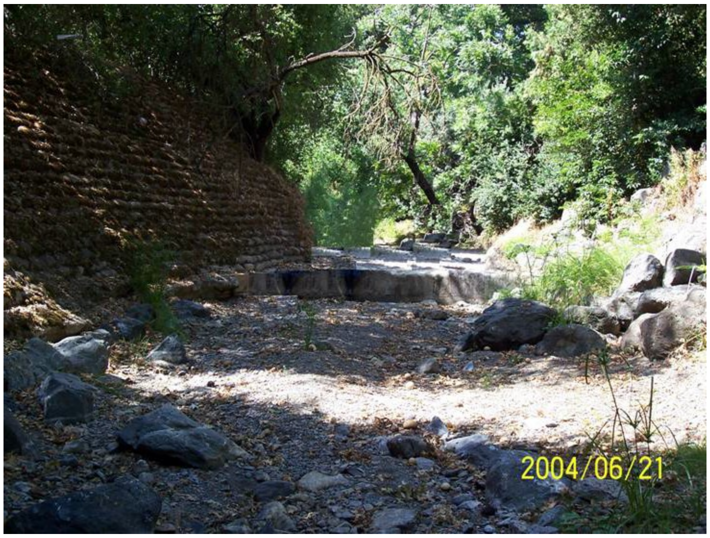
Calabazas Creek
Reach 33
Wardell Rd. to Comer Dr.

Figure 12

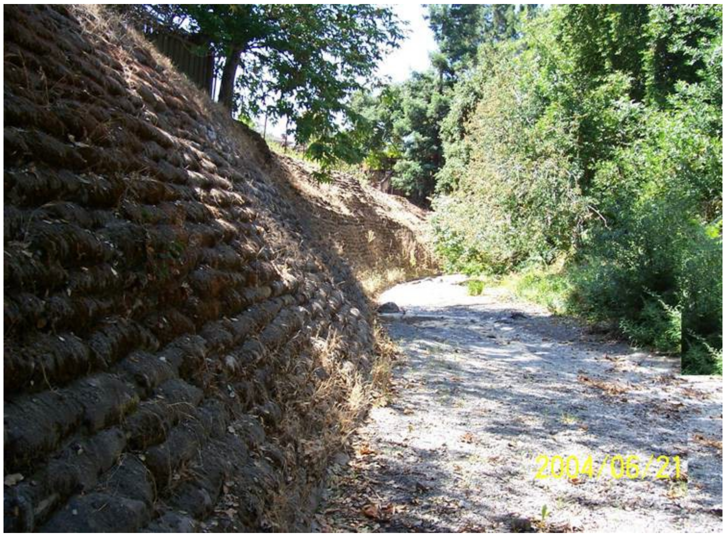
CALABAZAS CREEK



(STA 571+35)



A 571+99)



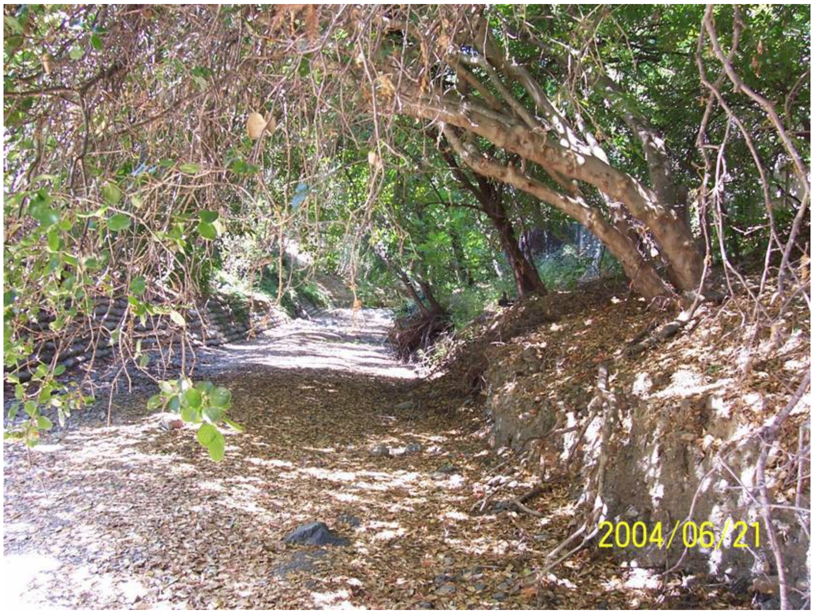
(STA 572+71)

Looking Upstream

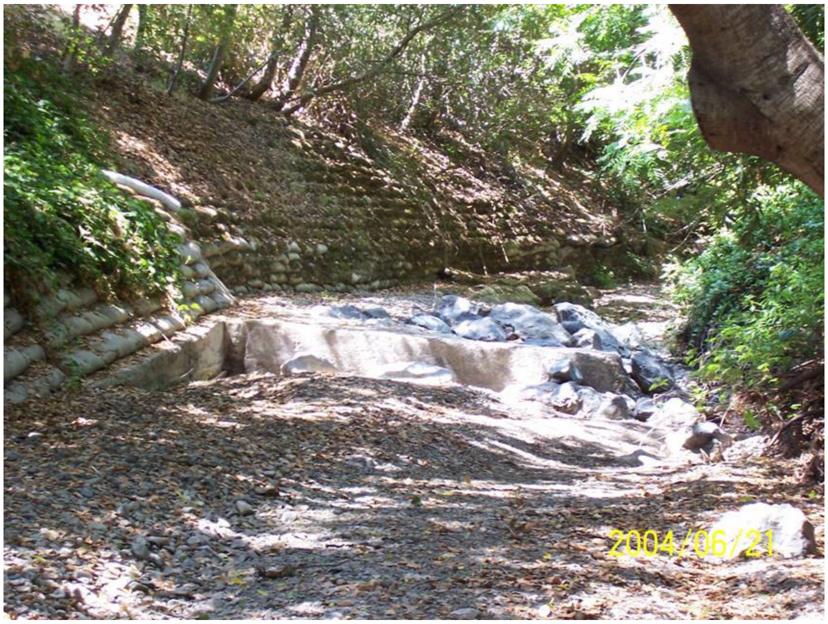
annel Description:

e channel is mostly straight in alignment and covered with sacked concrete on the left bank and natural earth on the ht bank. Top of both banks are fully vegetated with mature trees and right bank slope is covered with some mature es and shrubs and some undergrowth. The channel bottom material is mostly coarse gravel and some fine gravel h some pieces of rock. The channel at this location contains an approximately 2 feet vertical drop structure.

CALABAZAS CREEK



(STA 573+87)



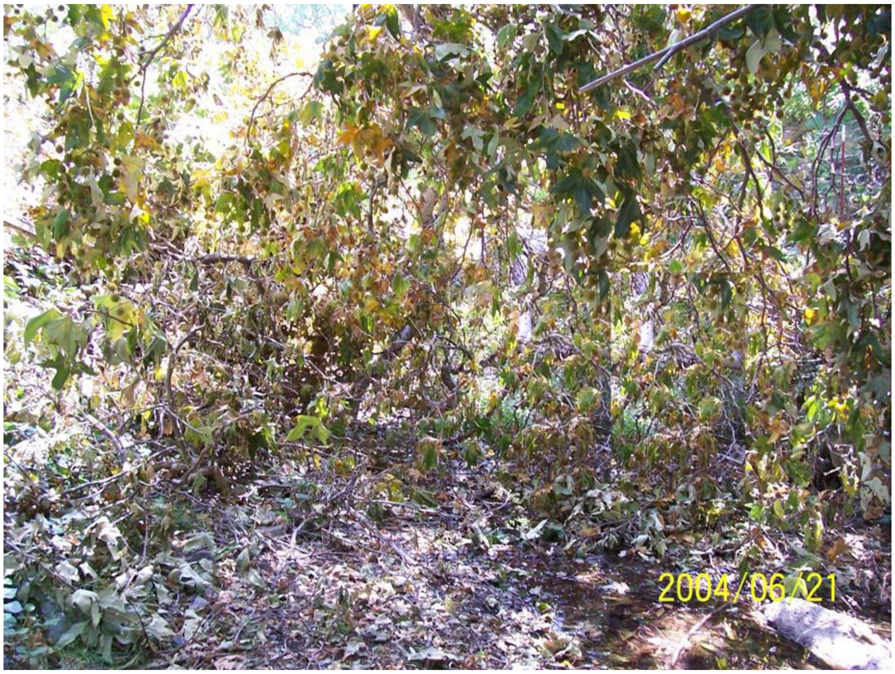
(STA 575+16)

Looking Upstream

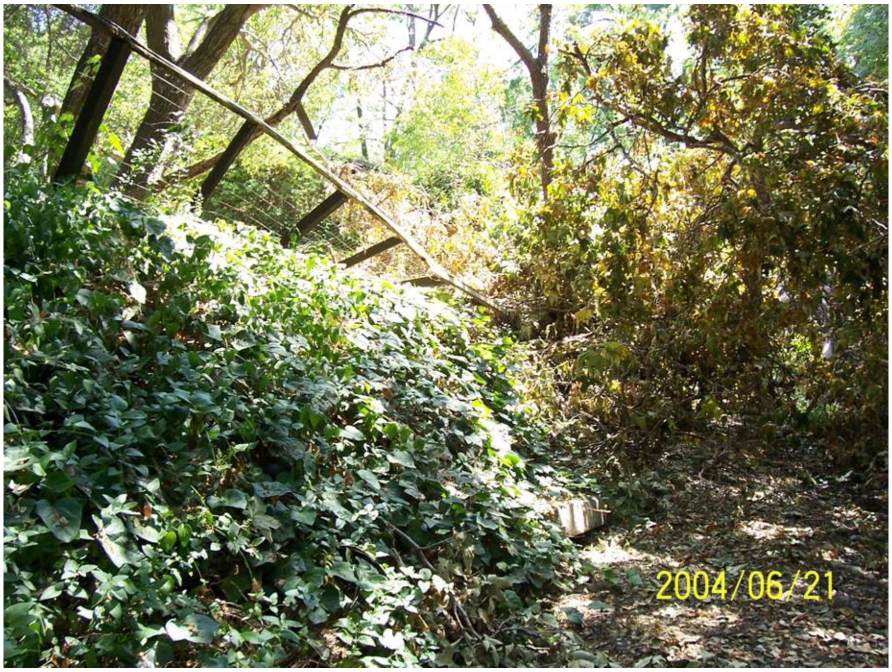
Channel Description:

The channel is a trapezoidal in shape with mostly straight and minimal meandering alignment. The channel has relatively steep left bank slope covered with sack concrete and shallow right bank slope with mostly bare soil and undergrowth in some areas. Channel invert consists of a drop structure and bottom material is mostly sand and gravel with some big rocks on top of the drop structure area.

CALABAZAS CREEK

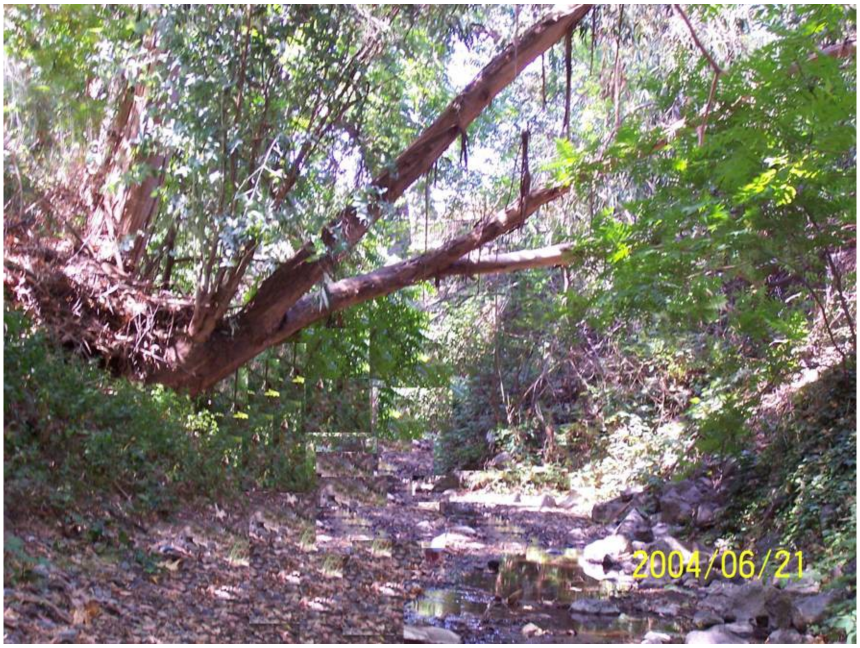


Looking Downstream, a big tree down in the creek. (STA 576+72)

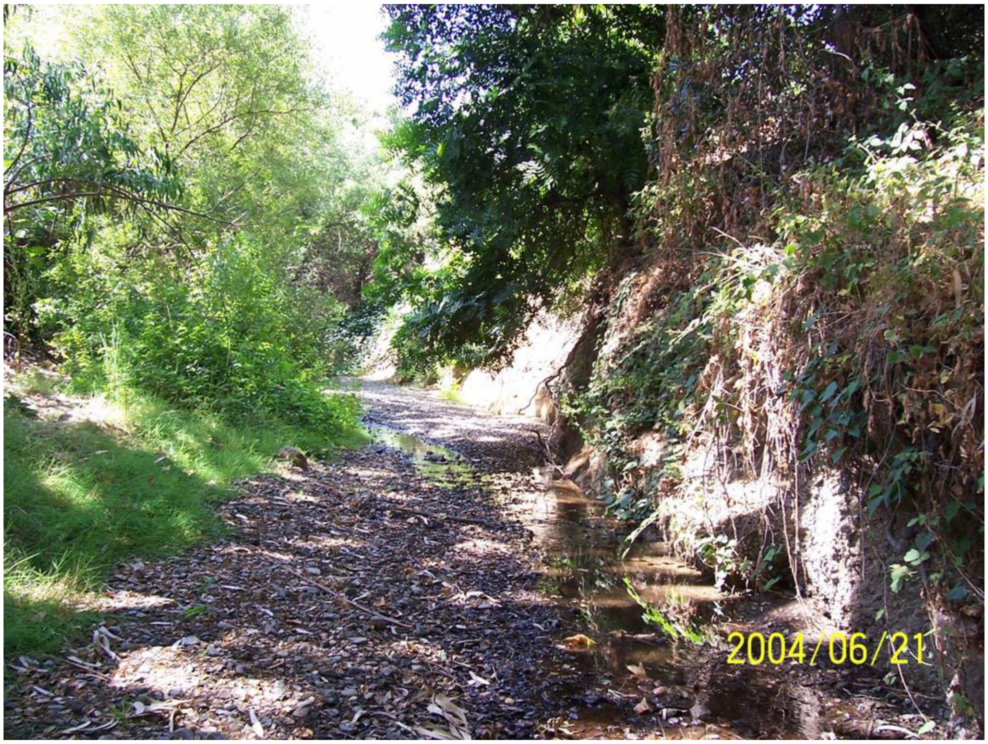


Looking Downstream, left natural bank with a broken fence. (STA 577+34)

CALABAZAS CREEK

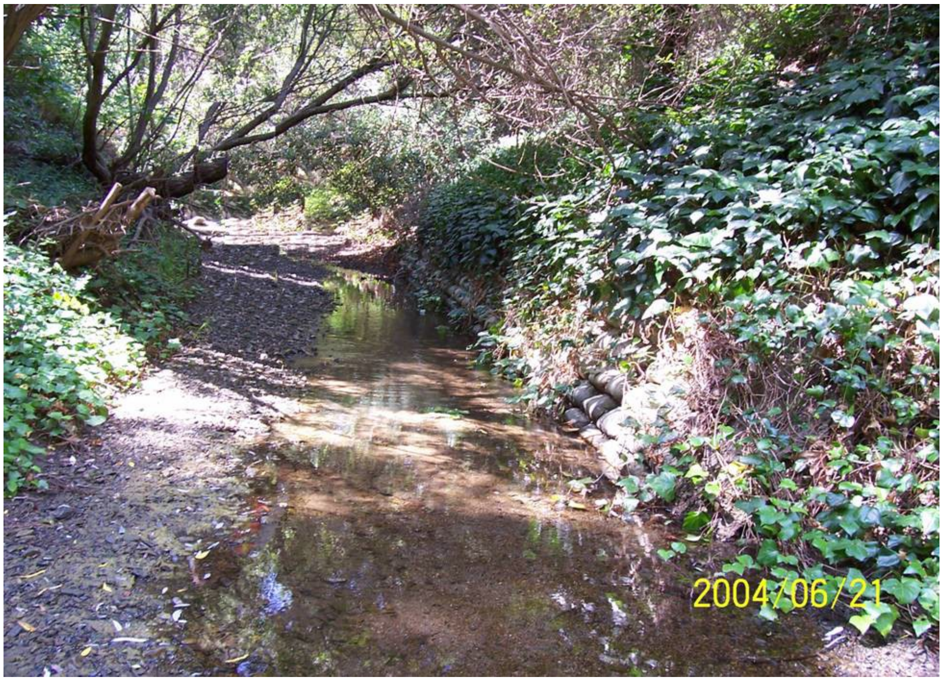


Looking Upstream (STA 578+00) ±

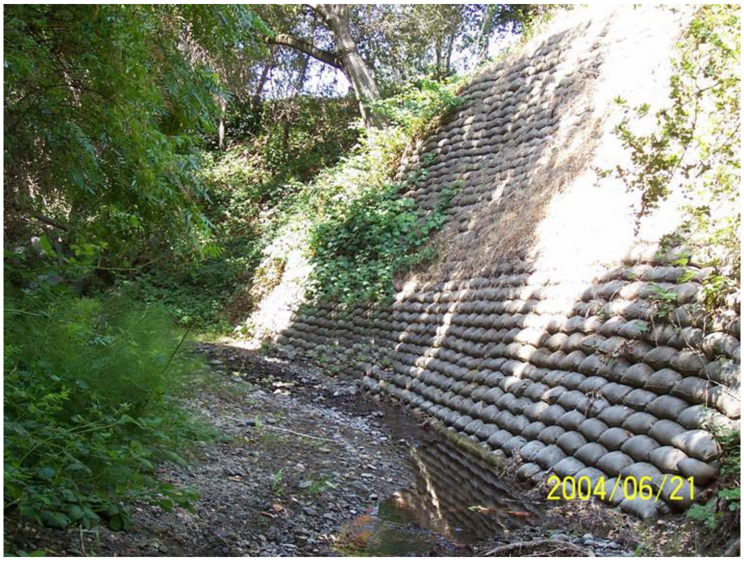


Looking Upstream (STA 578+28)

CALABAZAS CREEK



(STA 583+32)



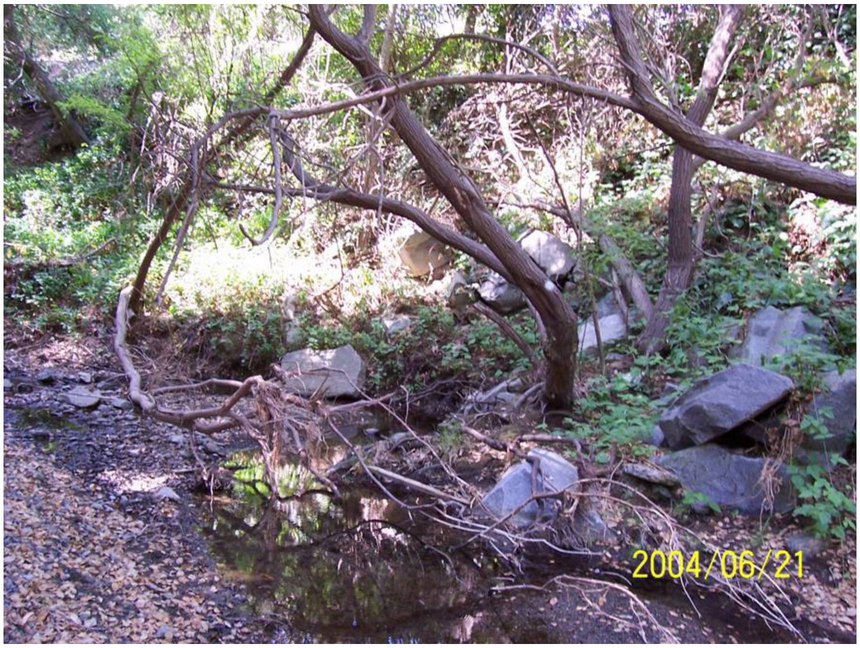
(STA 584+41)

Looking Upstream

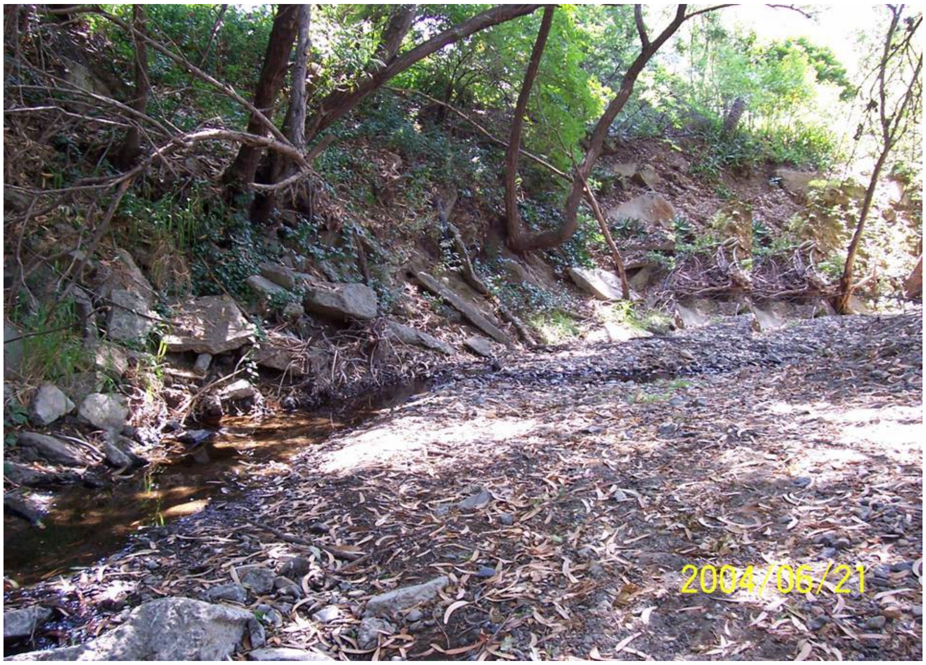
Channel Description:

The earth trapezoidal shaped channel varies from straight to sinuous alignment. Steep slope with sacked concrete on the right bank and covered with ivy at downstream side. Left bank is covered with some trees and other vegetation. Invert material consists of sand and gravel.

CALABAZAS CREEK



(STA 585+01)

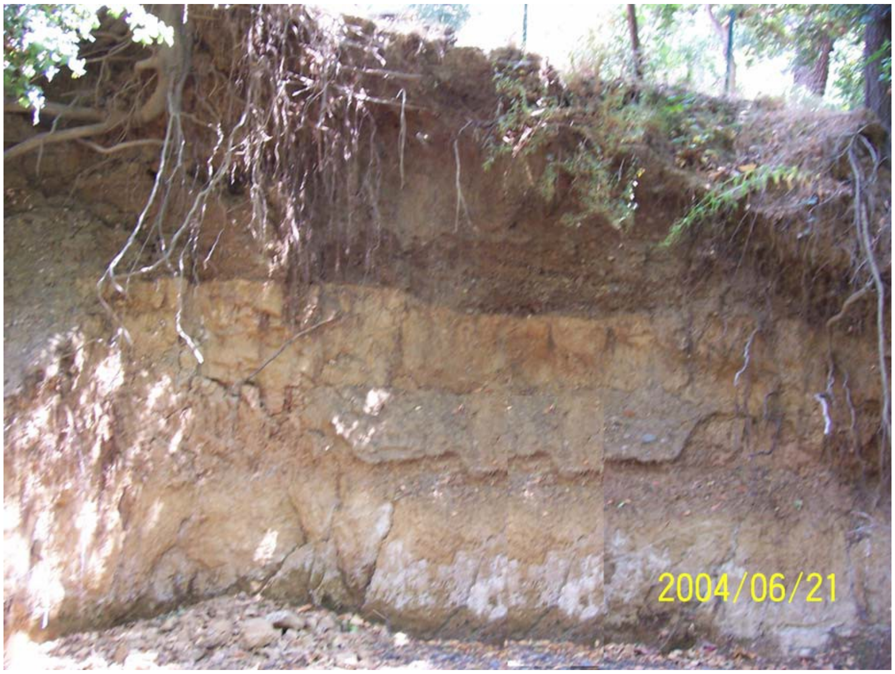


(STA 585+67)

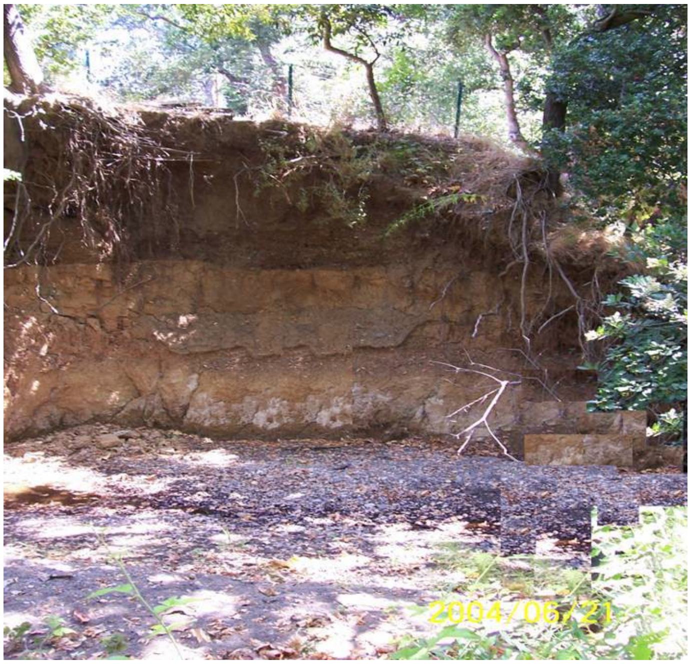
Channel Description:

The channel is a natural earth with a sharp curve alignment. Both bank slopes consist of bare soil and pieces of rock and broken concrete slabs and covered with scattered trees and some undergrowth. Channel has a wide invert covered with mostly sand and gravel.

CALABAZAS CREEK



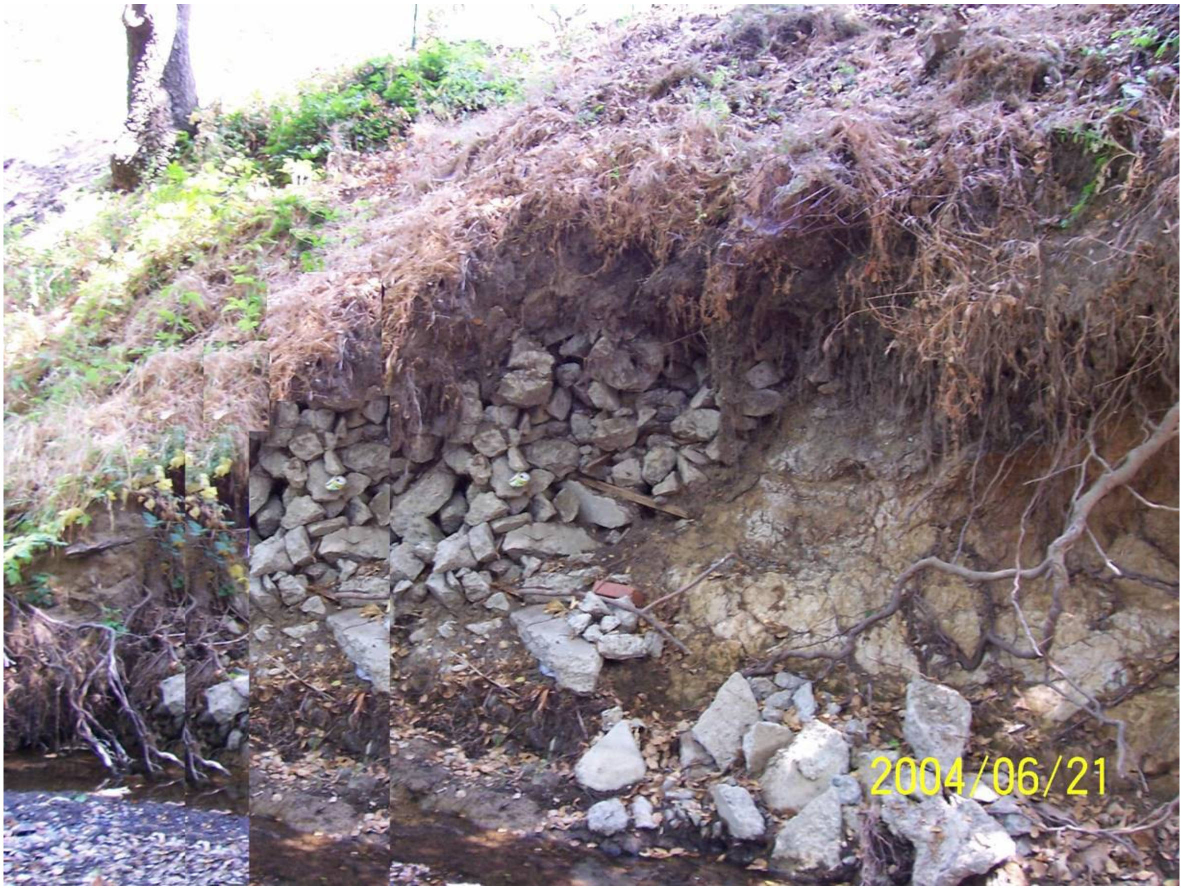
(STA 587+75)



(STA 587+75)

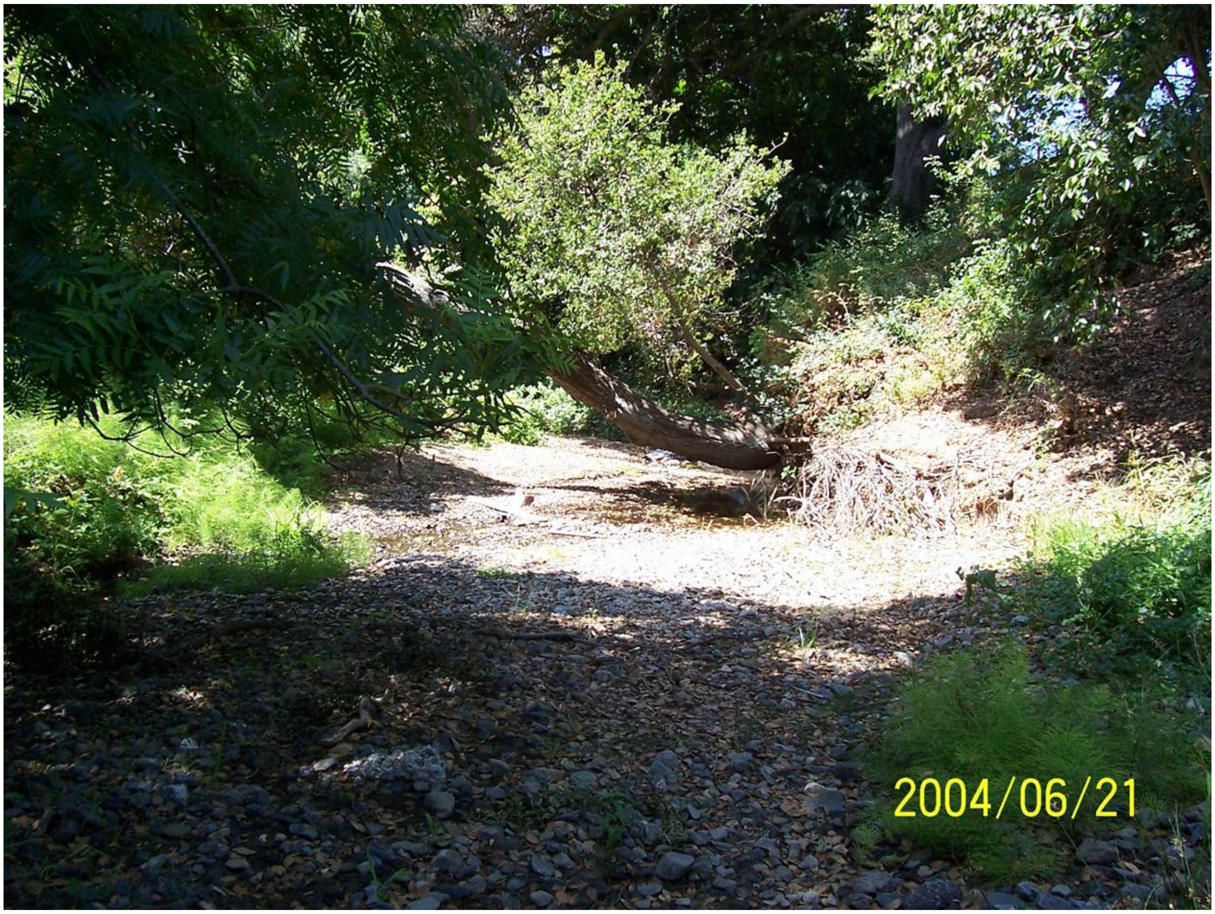
Looking Upstream, right bank erosion under trees

CALABAZAS CREEK



Looking Upstream, right bank concrete pieces (rock) under dirt, origin of rock is unknown. (STA 589+55)

CALABAZAS CREEK

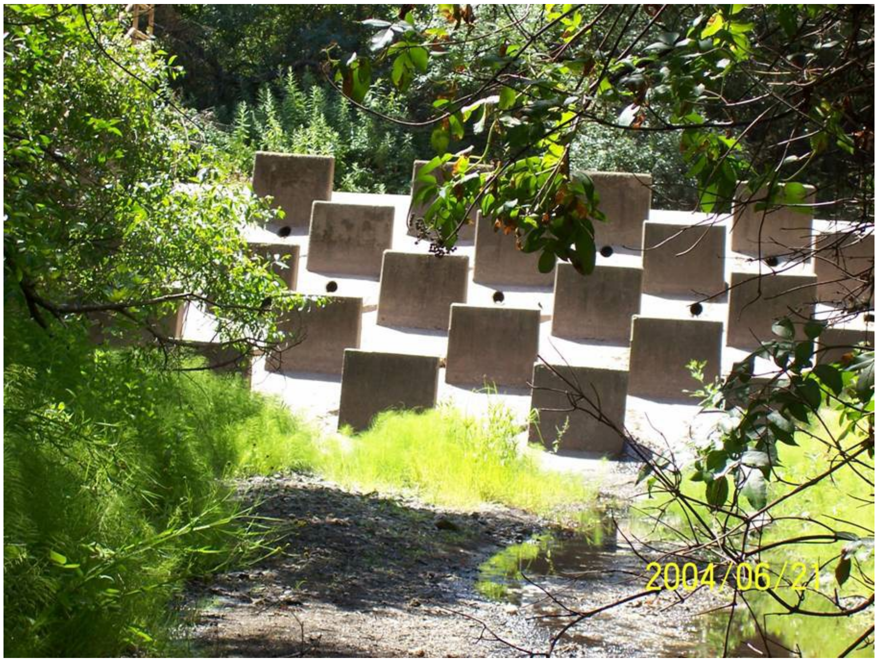


Looking Upstream (STA 589+87)

Channel Description:

A wide trapezoidal earth channel with mainly straight alignment. In this section a tree is crossing the channel. Channel is fully vegetated with mature trees and other vegetation. Invert is covered with some sediment deposition which consists of some undergrowth in some area.

CALABAZAS CREEK

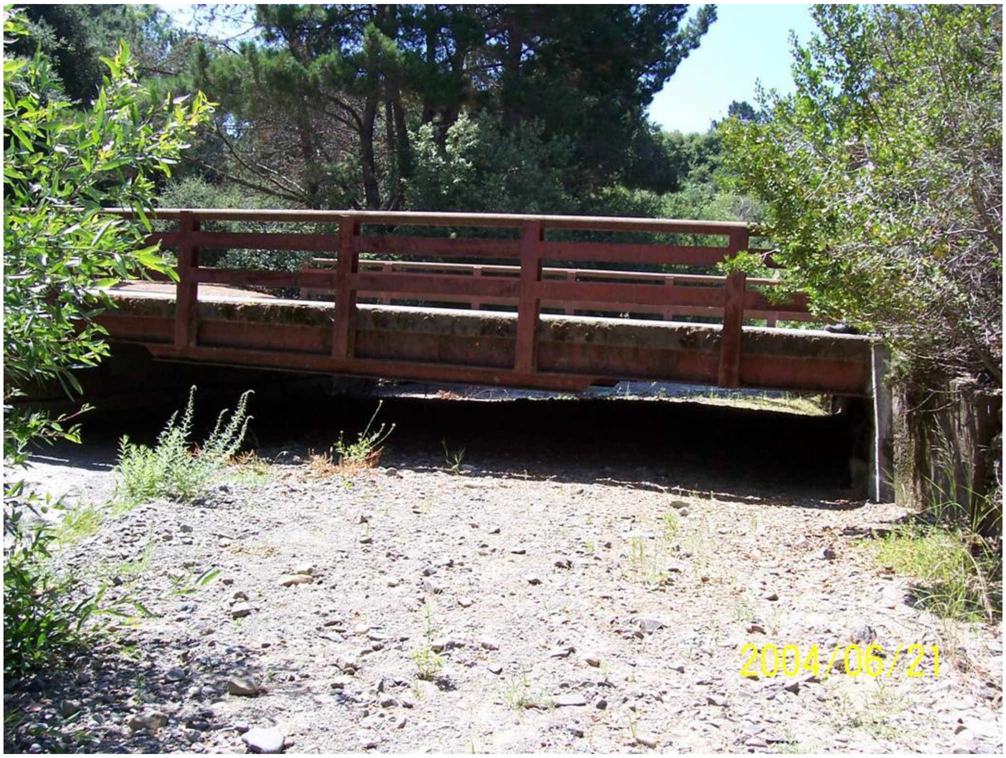

2004/06/21

Looking Upstream, debris basin, energy dissipater 25 feet drop structure. (STA 590+52)

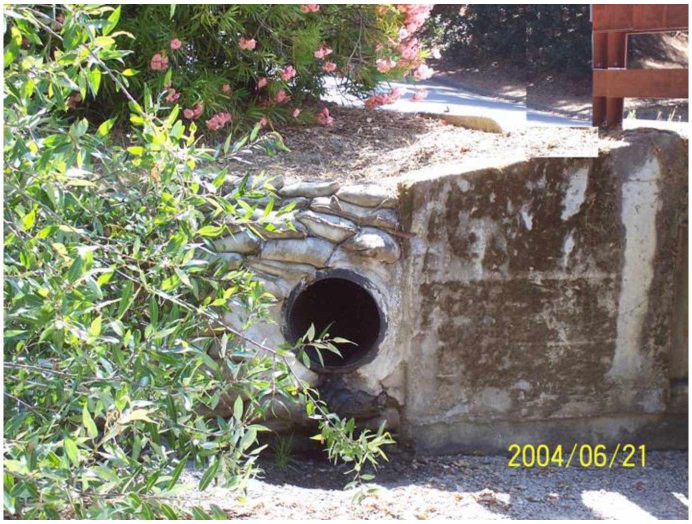
2004/06/21

Looking Downstream from top of debris basin (STA 591+00)

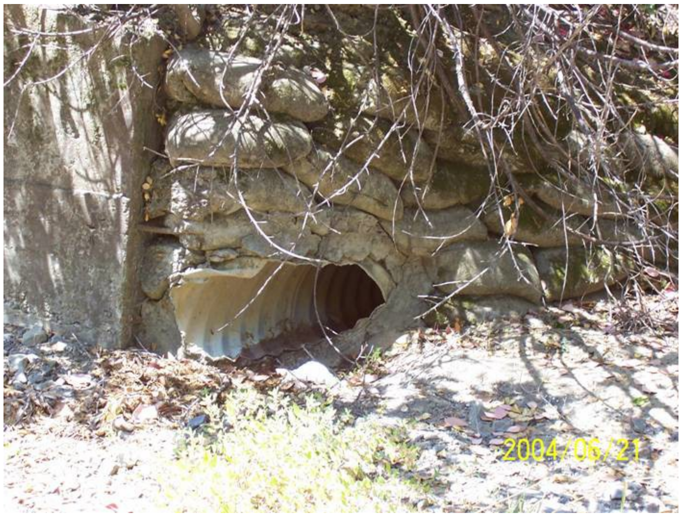
CALABAZAS CREEK


2004/06/21

Looking Upstream, downstream of Comer Drive Bridge (STA 593+55) ±


2004/06/21

oking Upstream, left wing wall with 18” outfall on concrete (STA
3+55)


2004/06/21

Looking Upstream, right wing wall with 10” outfall on sacked
concrete (STA 593+55)